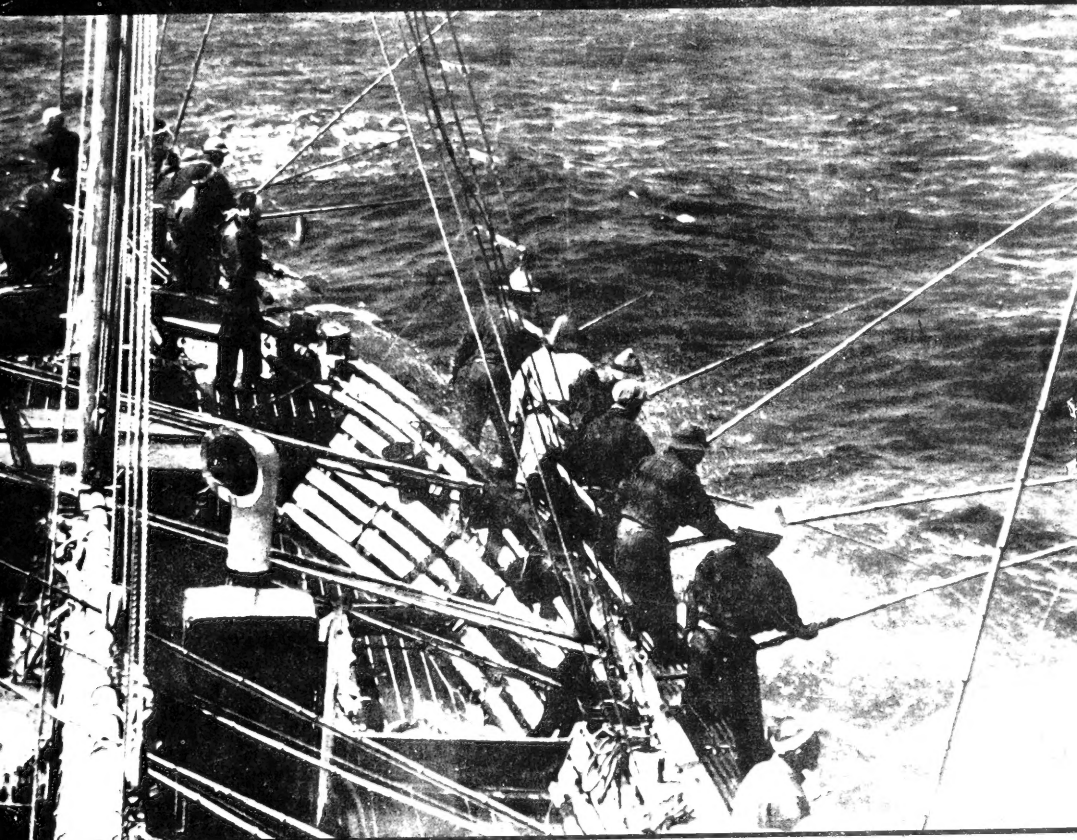


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Fishes

COMMERCIAL FISHERIES REVIEW



Vol. 12, No. 11

NOVEMBER 1950

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A REVIEW OF DEVELOPMENTS AND NEWS OF THE FISHERY INDUSTRIES PREPARED IN THE BRANCH OF COMMERCIAL FISHERIES

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Applications for COMMERCIAL FISHERIES REVIEW, which is mailed free to members of the fishery industries and allied interests, should be addressed to the Director, Fish and Wildlife Service, United States Department of the Interior, Washington, 25, D.C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, December 15, 1949

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COMMERCIAL FISHERIES REVIEW

November 1950

Washington 25, D.C.

Vol.12, No.11

JAPANESE SKIPJACK (KATSUWONUS PELAMIS) FISHING METHODS

By Fred C. Cleaver* and Bell M. Shimada*

INTRODUCTION

The Japanese have had centuries of experience fishing for tunas. Because the fishery developed in a culture much different from that found in other countries, it differs in many ways from the methods in use in the United States. The urgent necessity of securing food from the sea has provided strong motivation for the development of effective fishing methods. For the purpose of exploitation, research into the habits and ecology of fish has advanced more rapidly than elsewhere. Particularly in the warmer portions of the western Pacific, only the Japanese engaged in extensive exploratory tuna-fishing enterprises.

This report shall discuss only the Japanese live-bait fishery for skipjack (Katsuwonus pelamis Kishinouye). Personnel of the Pacific Oceanic Fishery Investigations of the U. S. Fish and Wildlife Service, who visited Japan to investigate Japanese tuna research and fishing methods, gathered the information in this article between November 1948 and June 1949 from discussions with fishermen, and officials of the fishing companies, and to a lesser extent from scientists and translated writings. Since the fishery was at a seasonal ebb during most of the investigation and fishing was abnormally poor during the latter part of the reconnaissance, when good catches might have been expected, direct observations were largely limited to the vessels and gear while at the docks. Because of the limited time available for reconnaissance, it was possible to make only one trip to the fishing grounds. The lack of first-hand observation is partially compensated by an extensive series of interviews with fishermen at ports from Tokyo to southern Japan. Although every possible precaution was taken to get a complete and accurate coverage of fishing methods, it is possible that errors have been inadvertently included. Such would arise from two sources, the most important of which is the language difficulty. It was often evident that while an interpreter understood the meaning of the words in a question, the thought was erroneously interpreted. Frequently answers were received which had no conceivable connection with the question asked. Secondly, Japanese fishing centers are so numerous that it was impossible to examine all of them, even where differences in operating methods were known to exist.

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HISTORY

The regular capture of skipjack for use in Japan as food cannot be traced in prehistoric times as is the case with some of the other tunas (Imamura 1949). However, regulations mentioning the use of skipjack as food were promulgated in the eighth century A. D., so it may be assumed that fishing began some time previously. Because this species has been highly prized as an article of diet since early times, considerable thought and energy have been devoted to increasing the catch.

In the earlier days, when fishing was conducted near land, only those schools that could be reached in small vessels powered by hand or sail were utilized. The fishermen rarely ventured as much as 10 miles from shore. In spite of equipment limitations, the industry was quite productive even at that time. The season was short. Fishermen were unable to follow the seasonal migrations, but had to depend upon schools which appeared within a few miles of shore. Despite the high value of skipjack, only minor changes occurred in the fishing techniques for hundreds of years.

With the advent of powered craft during the first two decades of the twentieth century, the fishery began to expand rapidly. At first explorations extended in an eastward direction, but after 1920 a southerly expansion began which continued until 1940. Just before the outbreak of World War II in 1941, the Japanese skipjack fishery extended eastward from Japan to 700 miles offshore, and southward to equatorial portions of the western Pacific Ocean. This latter area not only included the former Mandated Islands area and adjacent island chains, but also embraced the Sulu, Celebes, Java, and South China Seas, as well as other portions of the Indo-Australian Archipelago. To fish in this vast area, it was necessary that changes be made in equipment and techniques. The vessels became larger, and more powerful engines were installed. The southern extremity of the fishery pushed into areas where climatic conditions varied so greatly from those in Japan that methods peculiar to the South Seas were developed. Because these were in some respects quite different from methods found in the northern fishery, they will be described separately where necessary.

The trend of Japanese skipjack production in home waters and abroad has been presented by Shapiro, 1948. Total annual catch of skipjack from inshore waters since 1908 and for offshore waters since 1915 are also contained in a previous statistical report issued by the Natural Resources Section (Espenshade 1947). The 5 years from 1936 to 1940, inclusive, represent the highpoint in Japanese skipjack production. During this period, annual catches (including those made in both inshore and offshore waters) averaged approximately 238,000,000 pounds. The average annual production prior to 1936 was about 190,000,000 pounds. About 42,000,000 pounds were also caught yearly in the former Mandated Islands area in the years immediately preceding World War II. Statistics for this period for catches made in other colonial waters and for the Indo-Pacific region (where a skipjack fishery was known to exist) are not available. Catches in these areas were probably nominal, but indicative of the commercial abundance of skipjack. In 1936, 3,625,000 pounds of skipjack were brought to Formosan ports as contrasted to landings of 271,935,000 pounds and 31,455,000 pounds for the same year in Japanese and South Seas ports, respectively.

BIOLOGY AND ECOLOGY

The skipjack is closely related to the other tunas and mackerels. Remarkably streamlined in form, it is one of the smaller tunas. While it reaches a maximum

length of about 40 inches with a weight of approximately 40 pounds, the greater part of the Japanese catch is comprised of fish weighing less than 10 pounds. It is a warm-water species which may be found throughout the Pacific Ocean wherever suitable temperatures exist. Traveling in schools that may in some cases extend for miles, this species feeds upon various smaller marine animals, which in some instances include juvenile skipjack.

Although not conclusively demonstrated, it is generally accepted by the Japanese that skipjack caught in homeland waters are members of two general stocks, each including both migratory and resident populations. One stock, believed to originate in the region near the Celebes Sea, is thought to enter the Japanese fishery by following north along the Ryukyu Islands. Skipjack which are caught throughout the year near the shallow banks of the Ryukyus are assumed to be fish of this stock which have lost their migratory urge and have become sedentary. These are called "resident" fish. The former Mandated Islands are thought to contribute another migratory stock which moves toward Japan along the Bonin and Izu Islands, and also by way of the Kinan reefs. Resident fish are caught in these areas at practically all times of the year.

Although sufficient data are lacking from morphometric and marking studies to bring out the exact population relationships of skipjack caught in Japanese waters, the fact that the center of fishing moves progressively to the north from spring until autumn is a fairly good indication that the skipjack schools have migratory tendencies.

To further the exploitation of the skipjack stocks, the Japanese have studied extensively the relationship of ocean temperatures and currents to the catch of fish. Temperature ranges for the various species of tuna have been defined and these serve as guides for locating fish. Skipjack may be found in waters contiguous to Japan at temperatures from 63° F.-88° F. but occur most abundantly in waters ranging from 66° F.-79° F. In the South Seas, water temperatures above 82° F. are considered optimum for skipjack.

Skipjack in Japanese waters are said to be "isothermic." If the first good catches of the year are made in water of a certain temperature, experience has shown that water of this temperature will contain the schools as it moves northward in the spring with the Japan Current (Kuroshio). Large schools are particularly apt to be found in warm water pockets which have been isolated by masses of cold water. As the surrounded warm water mass decreases in size, it is believed that the fish are concentrated because they remain in the area instead of crossing the thermal barrier. Such "impounded" schools provide excellent fishing.

The decline in Japanese skipjack catches in recent years is provisionally attributed to a change in oceanographic conditions. However, the precise factors which bear upon the problem are not known, and conflicting views on this subject are held both by Japanese scientists and fishermen.

FISHERY FOR BAIT

GENERAL: The habits of the skipjack are such that the use of live bait has come to be the basis for the highly specialized fishing techniques. Consequently, it is felt necessary to include a description of the baiting procedure. In the main, the homeland fishery for skipjack bait and the fishery for skipjack themselves are entirely separate. Exceptions to this procedure in Japan are the small vessels which operate in a marginal skipjack fishery. These vessels are able to make good catches

only when the schools approach land and account for a minor portion of the total Japanese skipjack catch. The Japanese have found over a period of years that it is far more economical to employ a smaller number of men and less expensive equipment to fish exclusively for the needed bait than to cause the fleet to lose fishing time in search of bait. The advantages entailed are manifold. As pointed out above, it is not necessary for a fishing vessel to lose potential fishing time in baiting. This is particularly valuable during periods of good catch. Perhaps more important, it is possible for the bait fishermen to accumulate and impound a surplus of bait during periods of abundance of bait-fish schools. In this type of tuna fishing, it seems, both in the United States and Japan, that often bait-fish schools are scarce at just the time when tuna schools are most abundant and the need for bait is greatest. Since a ready supply of live bait is indispensable in avoiding costly delays in fishing, it is felt that this feature of the Japanese technique may be superior to that of the United States, and might be profitably investigated.

Fishing vessels usually purchase bait directly from the bait fishermen by stopping at the bait grounds before putting out to sea. During the peak of the skipjack fishing season, however, "bait carriers" (vessels which engage solely in the transport of bait) supply the fishermen at sea (Figure 1). These bait carriers (up to 50 gross metric tons in size) are generally operated independent of the bait and skipjack fisheries and profit by serving the needs of both. The bait fishermen are assured of a steady demand and the skipjack fishermen are able to save valuable time by not having to go far out of their way to secure bait. Furthermore, by being supplied with bait at sea, fishing vessels can load up with maximum catches when fishing is good. Bait carriers are especially active in central Honshu and ply their trade between the bait grounds in Tokyo Bay and the skipjack fishing grounds farther to the north. As a rule, these vessels do not transport fish back to port on their return trips, because of inadequate preserving facilities.

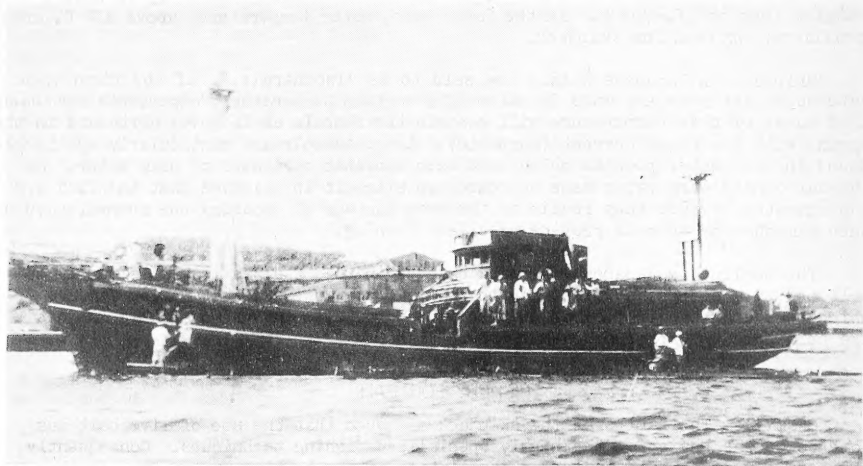


FIGURE 1 - JAPANESE BAIT-CARRIER VESSEL TAKING A LOAD OF BAIT FROM LIVE BOX. TOKYO BAY.

Although several other species are frequently used, the most common skipjack bait fishes in Japan are the anchovy (Engraulis japonicus) and the sardine (Sardinops melanosticta). The anchovy is said to be the better bait because it may be kept in the live wells more successfully than the sardine.

Although the size of the bait fish used often depends upon what may be available, fish from 3 to 5 inches in length are considered most desirable. The bases for choice are that the smaller fish are most resistant to death from confinement, although more liable to injury from handling, and can also be used more efficiently; a smaller bait fish seems to be as attractive to the skipjack as a larger fish would be, if not more so in some instances, and a greater number of the smaller fish can be carried per unit of bait-well space.

METHODS OF CAPTURE: The bait fishery operates concurrently with that for skipjack. In southern Japan this means that with the possible exception of January and February, bait is caught in the bays throughout the year. In central Japan the season is from April to November, reaching a peak during the summer months. Little bait is caught in northern Japan. The major bait-producing regions are Kagoshima Prefecture, and the area within 150 miles of Tokyo. Bait fishing is done primarily in the protected bays and inlets along the coast. Bait is more abundant in sheltered waters, and because the handling of the fish after capture must necessarily be gentle, the use of outer waters is almost precluded. Purse seines, lift nets, and weirs are the major forms of gear used.

The purse seines used in Shizuoka Prefecture are 300 fathoms long by 60 fathoms deep. They are made of cotton mesh ranging from about 1/4-inch stretched measure to 1/2-inch stretched measure, the smaller web being used in the bunt of the net. An illustration of this net may be found in the SCAP report on "Japanese Fishing Gear" (Kask 1947). The gear is set by two vessels, each of which carries half of the net. After pursing, the catch is crowded into a relatively small area of net between the two vessels, and is transferred to live boxes.

From the time the fish are first enclosed in the net until they are finally used as bait, extreme care is exercised to prevent damage to the fish. As the purse seine is dried up, the webbing is raised evenly to prevent the formation of folds in which the bait may be trapped and chafed or smothered. After capture is completed, the edge of the seine is submerged and the bait is gently crowded into the live box, the edge of which is also submerged so that the bait may swim into confinement without being handled.

A second popular method of bait capture is by means of the lift net. Basically, this consists of an apron of netting that is set in the water to catch fish which are lured into reach by lights hung near to or under the water during the hours of darkness.

Lift nets are of several types. The simplest (Figure 2) is a fine meshed rectangle which is generally about 50 percent deeper than wide, the width being roughly two-thirds the length of the vessel which fishes it (Takayama 1949). One edge of the net with the narrower dimension is buoyed by a bamboo pole 6 inches in diameter and long enough to project several feet at each side of the net. Two more poles are lashed, one to each end of this float pole, to hold it at a distance of 30 or 40 feet from the vessel. The opposite edge of the net is lightly weighted with 10 or 20 pounds of lead so that the net, when in the water, hangs as a vertical wall some distance from and parallel to the boat. From four to six lines are made fast to the bottom of the net so that it may be hauled up and toward the boat to enclose

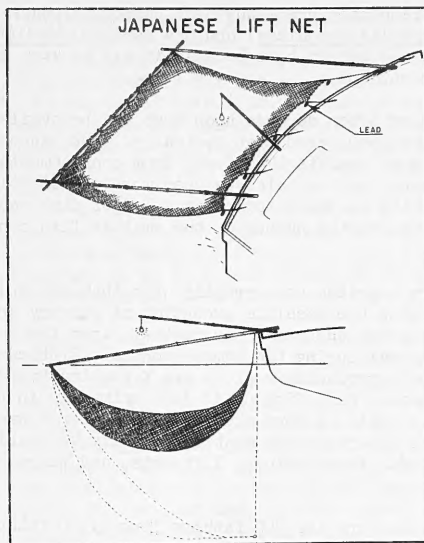


FIGURE 2

The fifth boat extinguishes the light and leaves the net by slightly submerging one of the raised sides. The net is then carefully pulled into the boats to confine the fish in a small portion of the net without injuring them.

Use of lights in bait fishing varies widely. In the method of fishing just described, all five vessels may carry lights to attract bait. After the fish have collected, the four outer boats will darken their lights so that the fish will assemble over the net. In the single-vessel type of net, lights may be hung on the side away from the net, both sides, or all around the boat. When fish have collected, the others are extinguished and the light inside the net may be turned on, or left on as the case may be, to lure the schools into the net. Lights on a string of floats may be used with wiring which permits the outer lights to be darkened first. Another variation is to have a small fleet of scouting boats with lights which may scatter to locate a school. When fish are found, the fishing vessel moves to the spot, sets the net, and turns on lights. The scout boat is then darkened so that the school will move to the lighted vessel.

The type of light used also varies considerably. Some boats will use gasoline lanterns, or an electric light of fairly high wattage (100w-500w) suspended over the water. Others use underwater lights which are suspended just beneath the surface. The underwater light seems to be more efficient although more difficult to rig and use. A reflector is generally employed to direct a diffused light into the area where the fish may be caught. Because the fish, while attracted more strongly to a bright light, may remain at a relatively greater distance from brilliant illumination, a rheostatic control can be provided to dim the light so that the school will gather closely about it.

any fish that may have been attracted to the lights which are in the rectangle formed by the poles. The net is constructed in a manner to allow the middle to sag and form a shallow pocket. This is done by sewing about 4 feet of webbing to 3 feet of line for most of the net. The net near the float pole is "hung in" more. There, about 5 feet of mesh are "hung" on 3 feet of line. As the net is lifted, the float pole is pulled to the vessel by drawing in the poles which held it away from the boat. After the fish are closely confined they are transferred to a holding box.

Another method of using a lift net requires five or more boats. Four are anchored to form the corners of a square of the same size as the net. The net is weighted and sunk between them, while the fifth vessel remains over the center of the net with a strong light to attract the fish. When a school of sufficient size has been attracted to the light, the men in the boats at the four corners of the net quickly raise the margins of the net to trap the fish.

A form of gear that is very useful in Chiba Prefecture, central Honshu, is the trap or weir. Set near the entrance to a bay, or in a spot where bait often congregate, large quantities are readily taken. These are gently transferred to a live box and towed to a sheltered location.

HOLDING: After capture, the bait fish are generally held in a live box for one to several weeks. To provide safety for the gear and the fish, the box or pen must be anchored in a protected area. To keep the fish alive there must be a gentle circulation of water through the box.

The live box that seems to be most successful is a net supported by an octagonal frame (Figure 3) of eight 6-inch by 8-inch timbers (roughly 10 feet long) which are used to provide rigidity and buoyancy. The ends are carpentered so that a tongue on the end of one will socket firmly in a hole in the end of that adjoining, and may be pegged in place. A bag of fine-mesh netting that measures about 1/4 inch on a side of a mesh is constructed to fit the frame and extend below it for 9 feet into the water. This netting may be either of cotton or palm fiber. The cotton is easier to work with as well as being smoother to the touch, but the coarse palm fiber was said to last for two seasons without treatment. The cotton must be treated with tanbark or other preservative every few weeks to prevent deterioration. A vertical row of four rope loops are sewn to the net every 3 or 4 feet around the circumference so that the net can be held in shape by sticks which pass through the frame.

The advantages of this live box are several. It may be readily taken apart for transport or repair; in fact, the frames may be made of light paulownia wood so that they can be carried about on the fishing vessel until bait is caught. There is no difficulty involved in removing the fish because the sticks which hold the net in shape may be removed to allow the fish to be crowded into any portion of it.

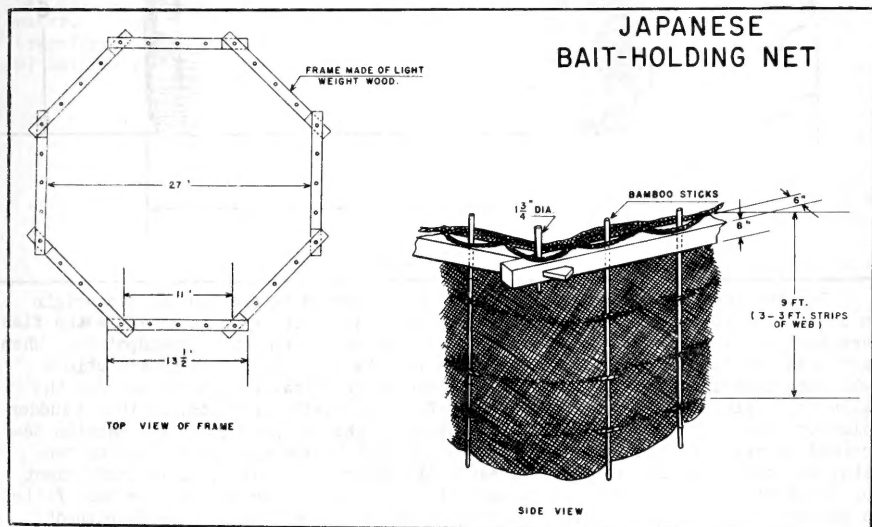
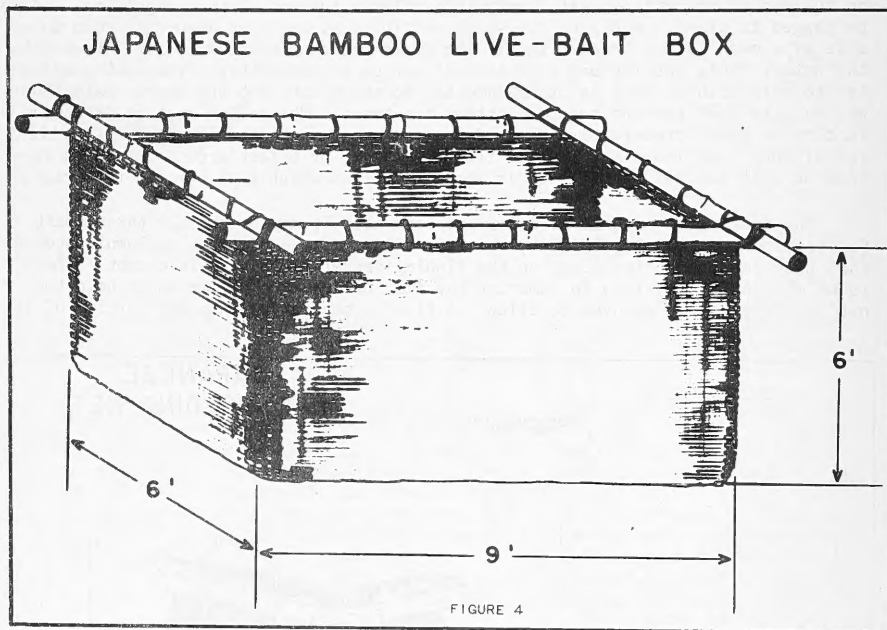


FIGURE 3

Further, it is very nearly round in shape which seems to encourage the fish to circle the box and become more quickly adapted to living in confinement with minimum losses.

Another type of live box in common use is of woven bamboo strips. These strips (about 1 inch wide) are woven loosely to form a rectangular box, 9 feet by 6 feet by 6 feet. The box is wired to a frame of 6-inch bamboo poles which act as floats (Figure 4). The advantages of this type of live box are that construction is relatively cheap in Japan, and it is darker inside, which is said to quiet the fish. This assumption is open to question, because bait wells aboard ship are generally painted white as well as lighted at night for the same reason. Fewer fish can be held in the bamboo box because circulation within it is not as effective as in the boxes of netting.



Perhaps the practice of holding bait for a period before use had its origin in the desire to provide a steady bait supply by accumulating a stock while the fish were available, but it has been found to be economical from other standpoints. When bait fish are first caught, they are often very "wild." If placed in the ship's wells immediately, they may injure themselves by frantically swimming against the walls or jumping out of the tank. "Wild" fish are easily startled, so that a sudden noise or shock may cause a large mortality among them by producing the reaction described above. Often some of the bait caught will be weakened or injured by handling so that excessive shipboard losses will ensue. Obviously, it is inefficient for a vessel to run the risk of losing valuable fishing time because the bait fails to survive until fishing begins. Consequently, in Japan "trained" or "hardened" bait commands a price several times that of freshly-caught bait.

In the holding process, the bait fishermen confine the bait closely in preparation for use in fishing. The weak and injured die in the live boxes and are removed to prevent fouling. These losses may ordinarily run from 40 to 60 percent, and occasionally approach 100 percent of the fish when first confined. The surviving bait fish become accustomed to living in a small space so that when placed in the wells of a fishing vessel they adapt themselves readily. The close confinement also serves the purpose of partially starving them so that they are more hardy and less susceptible to injury. "Well-trained" bait may be recognized by the fact that it is thin, circles easily in the bait wells, and does not become excited or frantic when approached.

Care is emphasized at all times in handling the bait. When removed from the net after capture, if possible, the fish are allowed to swim from the net into the live box.

This is accomplished by submerging a portion of the live box with the edge of the net closely applied to it, and gently herding the fish from

the net to the box; otherwise they are scooped up in buckets and transferred in water. They are handled by scooping with a dip net only as a last resort. When transferred from the live box to the bait well of a fishing vessel (Figures 5 and 6) bait is generally handled in a bucket of roughly 5 gallons capacity. These are passed aboard, after which the fish are allowed to swim from the bucket (rather than dumped) into the well.



FIGURE 5 - TRANSFERRING BAIT FROM LIVE BOX TO FISHING VESSEL, TOKYO BAY.



FIGURE 6 - TRANSFERRING BAIT FROM LIVE BOX TO FISHING VESSEL, TOKYO BAY.

It was repeatedly mentioned by fishermen that rapid changes in water temperature resulted in increased mortalities. Consequently, in the choice of a holding location, areas subject to marked diurnal temperature fluctuation should be avoided.

Regarding the space requirements of bait fish, a sardine 2-3/4 inches in length was said to require approximately .07 cubic feet of water at a temperature of 64° F. to 68° F. in a well where no mechanical circulation is used. By pumping water through the bait wells on a vessel, the space required may be decreased to .05 cubic feet. The density of

bait carried in a well varies. In southern Japan it was said that in a well (without mechanical circulation) 8 feet by 8 feet by 7 feet, up to 1,000 pounds of bait can be carried. The figures given for central Japan were about the same. At temperatures of 73° F. or less, 50 buckets may be kept in a well 6-3/4 feet by 6-3/4 feet by 9-5/6 feet without circulating equipment. A "bucket" of bait is a very indefinite amount, probably averaging in the neighborhood of 15 to 20 pounds of fish.

At Yaizu in central Japan, the catch seems to average about 1,000 pounds of skipjack per bucket of "hardened" bait. In Kagoshima Prefecture (southern Japan), the fishermen quoted figures which tended to indicate that from 2,000 to 4,000 pounds of skipjack may be caught per bucket of bait. These figures seem high, but the Japanese are known to be very economical in use of bait fish. In some cases, the assistant chummer will use a dip net to retrieve bait fish which have escaped the skipjack and sought protection by the hull of the vessel, so that they may be used again.

As a rule, the bait is fed very little except on extended fishing trips. During the winter or when natural food is scarce, the bait may be fed ground fish, rice bran, or silkworm pupae.

BAIT FISHING IN THE SOUTH SEAS: The bait-fishing techniques of the South Seas skipjack industry have their origins in the practices of the homeland. Because the familiar species and hydrographic conditions did not occur south of 20° north latitude, it was necessary to experiment with various new techniques for the fishery before a satisfactory system was improvised. The same procedures could not even be followed from one season of the year to another or between island groups. In this connection, it is worth while to mention that the Japanese skipjack fisheries in the South Seas were developed only after a lengthy period of persistent effort. Even with governmental subsidies, early efforts failed until suitable methods of catching and handling the fish had been evolved. It may be expected that any other nation which attempts to develop similar fisheries will find it necessary to spend a like amount of time and effort before a workable arrangement is discovered.

Whereas a few species provide a bulk of the bait in Japanese waters, because of scarcity it was found necessary to use a wide variety of reef fishes belonging to several families, in addition to the anchovies and herring-like fishes (Table 1). Because the fish so utilized are known only by the names given to them by the fishermen, it is difficult to identify many of them with described species. Sufficient

Table 1 - Some Bait Fishes Used by the Japanese Skipjack Fishery

Table 1 - Some Pet Fishes Used by the Japanese Skipjack Fishery/ JAPAN AND RYUKYU ISLANDS			
Scientific Name		Scientific Name	
Common Name		Common Name	
<i>Ambly opata</i>	kuroboshi-tenjukudai, urumi	<i>Harengula tsumai</i>	sappa
<i>Ambly truncata</i>	urumi	<i>Lutjanus variegatus</i>	mochinogawa, okifuefuki
<i>Atherina bleekeri</i>	tōgoro-iwashi	<i>Pomacentrus anabatois</i>	hichigawa, hikigawa
<i>Atherina tsurugae</i>	aharara, gin-isō-iwashi	<i>Pseudupeneus</i> sp.	himeji
<i>Beryx decadactylus</i>	gasagasa, manyō-kimadai	<i>Sardinella mizu</i>	hishinashi-iwashi, shiira
<i>Cassio caduclaus</i>	sawera, shikamuro-gurukun	<i>Sardinia imaculata</i>	ma-iwashi
<i>Cassio digramma</i>	gurukun	<i>Sardinia melanosticta</i>	ma-iwashi
<i>Caranx djadadze</i>	gatsun	<i>Scomber japonicus</i>	gasanoko, saba
<i>Engraulis japonicus</i>	katakuchi-iwashi, segurō-iwashi, terekuchi-iwashi		
SOUTH SEAS			
<i>Ambly</i> sp.	akadoro	<i>Harengula molluensis</i>	ma-iwashi, manyō-ma-iwashi
<i>Apogon</i> sp.	akadoro	<i>Labracoglossa argenteiventris</i>	takaba
<i>Archamia bleekeri</i>	atobiki-tenjukudai	<i>Mullus</i> sp.	ojisan
<i>Atherina</i> sp.	kokora, tobi-iwashi, tōgoro-iwashi	<i>Sardinella leiogaster</i>	manarōbu-iwashi
<i>Atherina valenciennesii</i>	manyō-tōgoro-iwashi	<i>Scomber kinaurata</i>	saba
<i>Cassio chrysocoma</i>	akamuro, gurukun, sawera, umiro	<i>Sphyrapne obtusata</i>	kamau
<i>Caranx leptolepis</i>	aji	<i>Spratelloides delicatulus</i>	ao-iwashi, baka, manyō-kibinago, shiira
<i>Caranx malibellus</i>	shima-aji	<i>Trachurus crumenophthalmus</i>	ma-aji
<i>Caranx</i> sp.	aji, gatsun	<i>Trachurus japonicus</i>	ma-aji
<i>Chilodactylus</i> sp.	akadoro	<i>Upeneus</i> sp.	ojisan
<i>Decapylus trimaculatus</i>	montauki	<i>Upeneus tragula</i>	yomahineji
<i>Decapterus russelli</i>	akamuro	<i>Upoleporus</i> sp.	ojisan
<i>Decapterus</i> sp.	maro, shima-maro	<i>Stolephorus heterolobus</i>	manyō-katakuchi-iwashi, terekuchi
<i>Garra squaleformis</i>	hiragai	<i>Stolephorus japonicus</i>	bakasaki, kibiko-iwashi, sururu

1/ The bait species listed herein were not limited in use exclusively to the area for which listed. They were used by the fishery wherever available in quantity.

Note: The data was obtained from: Prog. Rept. Okinawa Pref. Fish. Exp. St. for 1937; Marukawa, H., South Sea Fisheries 5 (5), 1939; and Dr. Y. Hayama, Tokyo University, Tokyo, Japan.

information is not at hand to allow a complete account of the baits used, but some are available for a few localities. At Saipan and Tinian Islands, the "fool bait" (*Spratelloides delicatulus*) was the preferred species, but young carangids, filefish, atherinids, and *Caesio* sp. were caught near the reefs for use as bait. In the Palau Islands, the best bait seemed to be the anchovy (*Engraulis heterolobus*?) but during periods of shortage, numerous kinds of fishes were used, including the same ones mentioned for Saipan. Fishermen who had fished at Ponape and Truk inferred that the bait used there was the young of *Priacanthus* sp. R. O. Smith (1947) stated that the one- or two-inch anchovy (*Anchorella purpurea*) were the best bait at Truk, but the bait shortages caused a curtailment of the fishery from February to July.

In general, the sizes of bait used were governed by the species available. *Spratelloides* sp. (1-1/2 inches in length) were considered to be good bait; conversely, the fishermen were forced to use some species of 6 or 7 inches, although these often failed to attract the skipjack in the desired manner.

Both of the net types described for the Japanese fishery as well as several others were used in tropical waters. Lights were particularly effective in the capture of bait in the Palaus when used with a lift net. A variation of the

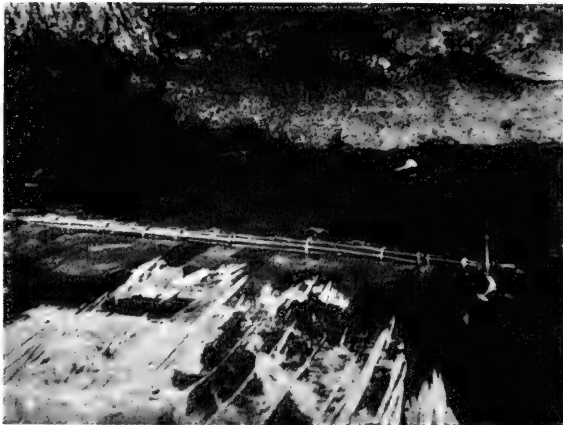


FIGURE 7 - SETTING LIFT NET FOR SKIPJACK BAIT, TINIAN, M. I.



FIGURE 8 - LIFT NET SET FOR SKIPJACK BAIT, TINIAN, M. I.

lift net was seen in the technique employed at Tinian (Figures 7 to 12). The fishing vessel would anchor near the cliffs and set the net. The crew would then swim along the cliffs, round up a school of "fool bait" (*S. delicatulus*), and herd them into the net.

The Okinawan drive-in net was used throughout the South Seas to catch reef fish. The net consisted of a large pocket flanked by wings of netting (Kask, 1947). This was set in an open space between the reefs. Fish were herded into the net by the swimmers who formed a large semicircle



FIGURE 9 - SKIPJACK FISHERMEN DRIVING BAIT INTO NET, TINIAN, M. I.

which would converge on the net opening.

Bait was handled in an entirely different manner than is the case in Japan. The outstanding difference was in the fact that the bait was almost never held for any length of time prior to use. The anchovies and herring were found to be extremely delicate, so delicate in fact that they died after a day of impoundment. This obstacle was met by catching the bait during the night or early morning hours, and using it immediately. The bait surviving at the end of the day was frequently eaten by the fishermen. The system was practicable because the

baiting grounds were within a few hours run of the skipjack fishing grounds.

Some of the less desirable bait fish survived quite well in the bait tanks. Caesio sp. and Priacanthus sp. lived almost indefinitely. In general, the reef fishes which proved to be less attractive as bait were easier to hold.

The difficulties encountered in catching bait and keeping it alive aboard a vessel caused the Japanese to investigate possible solutions to this problem. Attempts were made to fish the South Seas with large vessels by carrying bait from Japan. The sardines from central Japan were unable to survive the high temperatures encountered. Fishermen at Yaizu in Shizuoka Prefecture stated that the maximum water temperature which sardines could stand while in a bait tank was 77° F. Since higher temperatures are commonly found in the tropics such trials were not successful. Attempts were made to keep the bait through the use of refrigeration coils in the bait wells. Failure was encountered



FIGURE 10 - BAIT NET CLOSED AFTER DRIVE, TINIAN, M. I.

because the fish become overcrowded and smothered while trying to get into the cooler water surrounding the coils.

The fishermen from Makurazaki in Kagoshima Prefecture were able to carry anchovies to the Sulu Sea for use in skipjack fishing. They gave the maximum temperature tolerance of bait sardines as 81° F. and that of anchovies as 86° F. Since they pursued a winter fishery in the Sulu Sea, at which time the prevailing water temperatures were 79° F.-81° F., this allowed a small margin of safety for the use of anchovies.

FISHING GEAR

Although the Japanese vessels and gear resemble in a general way those used in the United States for live-bait tuna fishing, the interchange of ideas has been by no means complete. The fleet in Japan is composed of both wooden and steel vessels. As in the United States, there has been a marked tendency toward larger vessels. The number of boats of greater than 60 gross metric tons increased from 3 in 1924 to 342 in 1938. Many of the newer vessels are in the 100- to 200-gross-ton class. There appear to be two general types of construction in the skipjack fleet. The majority of the vessels, including all of the smaller boats, are built along the lines of a sampan. Some of the larger ships are combination live-bait and tuna long-line vessels which are modeled to resemble the North Atlantic trawlers.



FIGURE 11 - BAIT NET DRIED UP FOR TRANSFER AT TINIAN, M. I.

Among the outstanding differences between U. S. and Japanese fishing methods are the larger crews found in the Japanese fishery. The smallest vessels, which are under 30 feet in length, may have a crew of five or more men, while a 160-gross-ton vessel (about 90 feet over-all) will carry a crew of 60 men. This is desirable from the boat owner's standpoint for it assures a maximum catch when fish are found. It is possible to use such a large crew only by carefully training the fishermen and equipping the vessel in a manner to permit many fishermen to work. The fishermen serve years of apprenticeship before they are able to catch fish effectively under crowded conditions. The vessels have an outboard walk or rack which extends around the stern, along one side of the vessel and round the bow. On a smaller portion of the fleet this walk extends completely around the deck (Figure 15). Because the fishing walk is at deck level, or slightly above, and the deck is relatively high in Japanese vessels, Japanese fishermen fish at a position which may be from 5 to 10 feet above the surface of the sea, depending upon the size of the vessel.

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This elevated position has both advantages and disadvantages; in any event it necessitates use of a fishing technique different from that of the United States.

The height above the water is said to allow fishing operations to be conducted under sea conditions which would cause an American tuna clipper to cease fishing because the fishermen could not stay in the racks. The major drawback seems to be that the greater distance above the sea surface increases the difficulty of landing fish.



FIGURE 12 - LOWERING SCOOP OF BAIT INTO BAIT WELL AT TINIAN, M. I.

Whether or not the height of the fishing platform is the primary reason, the Japanese skipjack fishermen use a bamboo pole much longer than is common in the United States tuna fisheries. For large fish a pole as short as 10 feet may be used, but the ordinary skipjack pole may be as much as 18 or 20 feet in length. Such poles are 1-1/2 to 2 inches in diameter at the butt, and from 1/2 to 1 inch in diameter at the tip. The pole is of necessity very springy. The great length makes it difficult or impossible for the fishermen to lift large fish.

The line is 1 or 2 feet shorter than the pole so that the fisherman can catch the fish under his arm. The line itself is not particularly unique. The upper portion is fastened in a loop at the rod tip. The lower portion is fastened to a twisted cotton piece about 1 foot in length

which has a knot at the bottom end to facilitate the rapid changing of the leader that is attached to the lure.

The material and weight used in the line, as well as the length of the pole, may be varied to suit the vigor with which the fish strike. If the fish are biting excitedly, shorter poles, and strong, coarse lines may be used. Should the school be wary, longer poles and lighter line or silkgut line may be used.

Two general types of lures are used. These are the artificial squid and live bait. The artificial lures are made of a barbless hook to which is attached a metal or bone "head" and which may or may not have a "body" or feathers or other material. The lures, which are quite similar throughout the world were illustrated by Kask (1947).

The equipment of the ship varies somewhat from that used in the United States. This is true of the bait wells in particular. The bait carrying space is all below decks, generally in or slightly ahead of the middle portion of the vessel. Construction is relatively simple; the fish holds are built rather small, and have watertight bulkheads so that they may be flooded to carry bait. Very few ships have pumps to circulate the water. Instead, holes are cut through the hull so that circulation will be provided by the rise and fall of the ship. Vessels of 125 gross tons will

have 4 or more wells. A well 7 feet by 7 feet by 9 feet will have in the bottom 16 screen-covered holes, 8 inches in diameter. The holes are furnished with either plugs or metal caps so that they can be made watertight (Figure 14). To empty the well for storing the catch, the fishermen swim down and plug the holes so that the space may be pumped dry. The simple bait retention facilitates used aboard the Japanese ships are advantageous from the standpoint of economy of installation and operation. However, a mechanical circulation system, such as used on the West Coast of North America, enables the vessel to carry a greater quantity of bait in the available space. Further, the bait can be held while at anchor in calm water, because the motion

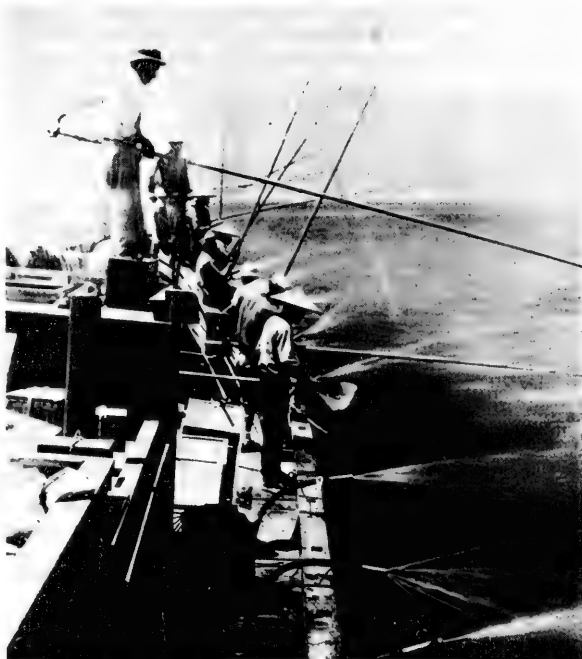


FIGURE 13 - SKIPJACK FISHING FROM JAPANESE SAMPAN.

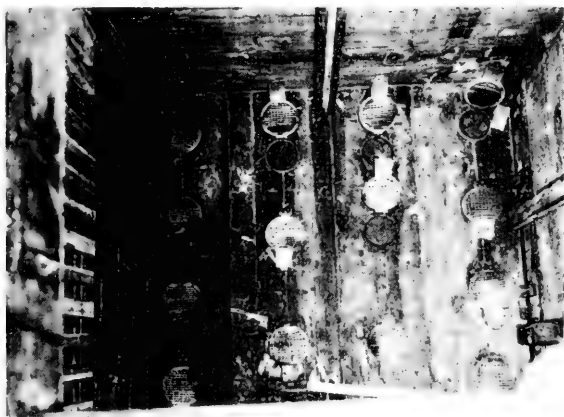


FIGURE 14 - CIRCULATION PORTS IN BAIT WELL.

of the ship has no relation to circulation within the bait tanks. The Japanese meet this problem by carrying a collapsible bait box such as described earlier. When it is anticipated that the vessel will be at anchor for any length of time in sheltered waters, the bait is transferred from the wells to the live box for safe keeping.

A development which is unique to the Japanese style of live-bait fishing is the spray system (Figure 13). All of the skipjack vessels have this equipment. It consists of a power-driven pump which

supplies a constant flow of sea water to a number of spray outlets which are situated at 3-to 4-foot intervals along the walk from which the fishing is done. A 125-gross-ton vessel will have one or two centrifugal pumps with 4- to 5-inch intakes.



FIGURE 15f- FISHING RACK OF A 150-TON JAPANESE SKIPJACK VESSEL.

These deliver water into one or two header pipes, depending on whether fishing is done from one or both sides of the ship. A distributing pipe is laid along the fishing walk (Figure 15). Near the header this pipe is 4 or 5 inches in diameter, but may taper to 1 or 2 inches in diameter at the end. From the main pipe, short lengths of 3/4-inch-diameter pipe point outboard. A few feet of rubber hose, bearing a piece of brass tubing, are attached to the end of this pipe. The brass tubing is flattened to squirt water as a horizontal, fan-like spray. The water pressure is low and such that a gentle spray falls between 6 and 18 feet from the hull of the vessel, forming a ruffled band which will be from 4 to 8 feet in width.

Because the major portion of the catch in the past has been consumed fresh (unfrozen) or dried, mechanical refrigeration equipment in the skipjack vessels is lacking or of relatively small capacity. Only recently has there been serious investigation of brine-freezing of tuna aboard the vessel for canning on shore.

In most cases ice is carried to prevent spoilage, and voyages are short in duration. It must be noted that this applies only to the skipjack fishery. The tuna long-line vessels (which catch other tunas) may spend a month or more fishing. However, since the skipjack are taken in warm waters (66° F.-79° F.), many of the larger vessels have small ammonia systems to cool the holds and thereby prevent the ice from melting as rapidly as it ordinarily would.

The use of radios among the fishing fleet is of a highly organized nature. In almost every tuna fishing center of any importance, there is a radio station maintained by the local tuna fishing association. These are of value in that not only is the ship in daily contact with the base so that the date of arrival in port as well as size of landings can be forecasted, but also they promote greater fleet efficiency. The entire fleet may know at all times where the best catches are being made; consequently, less time is lost in unproductive scouting. Also, the regular contact makes aid to distressed vessels more reliable. Recently, the severe competition in some areas has made the fishermen reluctant to broadcast news of good catches.

The equipment used in the South Seas fisheries was essentially the same as that used in Japan; indeed, some of the larger vessels voyaged from central and southern Japan to the Sulu Sea and adjacent waters. The major difference was in size of vessels. Because the fishing grounds were near the South Seas bases, because the catch spoiled rapidly, and because the bait fishes used did not live any length of time

in the bait wells, small vessels which made daily trips were found to be more efficient. These sampans ranged from 26 to 50 feet in length, and carried crews of from 5 to 25 men. A factor which may have had a bearing on the size of vessel used, but which was not mentioned, was the difficulty often encountered in catching bait. Although enough bait might be caught to supply a small vessel, in most places bait was not found in sufficient quantity to supply a large vessel.

FISHING TECHNIQUES

LOCATING SKIPJACK SCHOOLS: Since the success of any live-bait fishing operation for skipjack depends largely on the ability of fishermen to locate fish schools and to fish these with maximum effectiveness, Japanese skipjack fishermen have learned to place much emphasis upon the ability to recognize signs of fish and to judge conditions which may directly or indirectly reveal the presence of fish. Some of their locating methods, such as the use of oceanographic data, are unique and may well be used to advantage by American tuna fishermen.

In general, Japanese live-bait fishermen rely on one of several factors or a combination of factors to find fish. Of primary importance perhaps is experience, born of long years at sea. By closely observing the conditions under which fish are usually found and by collating data from personal logbooks, the fishermen are able to predict with reasonable accuracy the availability of skipjack on the fishing grounds, both with respect to season and area, and plan their operations accordingly.

Although experience serves as a valuable guide in narrowing down the time and area of search, the actual spotting of skipjack schools at the surface is done by means of scouting. By watching for certain well-established signs which point to the presence of fish, the fishermen are able to find the schools. Of these signs, birds are considered to be the best since they are visible from a distance. Furthermore, schools of skipjack accompanied by birds generally offer excellent fishing. According to Japanese fishermen, the activity of bird flocks indicates whether or not the skipjack schools being followed can be fished. Schools of fish with birds hovering high overhead are usually considered to be "wild" fish - skipjack traveling at a fairly fast rate which will not stop to feed. On the other hand, "working birds" (birds which continually dive in and out of a school) indicate by their actions the presence of actively feeding skipjack. Such schools provide the best catches because they can be drawn to the side of a fishing vessel by bait fish. A flock of birds resting on the surface may point to the presence of a school at lower depths. As a rule, the size of the fish school is thought to be proportional to the number of accompanying birds; the greater the number of fish, the larger the flock.

As previously pointed out in the discussion on biology and ecology, water temperatures play an important part in the skipjack fishery. Knowing the temperature limits and optimum ranges for the occurrence of skipjack, the fishermen are able to delineate the areas where schools of fish are most likely to be encountered. Therefore, Japanese fishermen will take surface temperature readings almost constantly when searching for skipjack. Furthermore, a sharp fluctuation in temperature may indicate a zone of discontinuity between water masses of two different characteristics. These current contact areas are said to be especially good for skipjack fishing because the fish are attracted by the presence of natural food.

Other oceanographic conditions, such as, water color and current flow, are important to skipjack fishermen because they show the fishermen when they have entered

the Japan Current. Clear, dark blue water and a current flowing in a general north-erly or northeasterly direction identify the warm Japan Current where most schools of skipjack are to be found.

In addition to visual and oceanographic signs, Japanese fishermen rely heavily on so-called "associations" to locate skipjack. They have discovered through experience that schools of fish are often found near floating driftwood, debris, and large marine creatures, such as, whales and basking sharks, which normally inhabit surface waters. Although the exact reasons why skipjack are attracted to floating objects are not known, it is possible that they congregate to feed on small fish and crustaceans which gather around flotsam. Whales and sharks are said to be symbiotically associated with skipjack - they act as scavengers and at the same time provide cover for skipjack.

Schools of skipjack which follow driftwood can be more readily fished, if they take live bait, than those found with sharks and whales. Large pieces of wood which are covered with barnacles, seaweed, and other marine growth and which float with the long axis vertically in the water, have been found to hold special attraction for skipjack. When such driftwood is located by fishermen, they range slowly along-side and chum with a few live bait fish. If skipjack are not seen, the fishermen continue on their way. This, however, depends upon the discretion of the captain. A vessel will often tie up to the driftwood, if it is large enough, or will remain in the vicinity until the captain is satisfied that skipjack are not to be found.

Trolling jigs are used to locate subsurface schools of fish. Jigs are dragged behind the fishing vessels at all times when approaching the fishing grounds and while on the fishing grounds. In Kagoshima Prefecture, fishing boats set out several feathered trolls as soon as they have entered areas having optimum water temperatures for skipjack, usually above 66° F. If while trolling a skipjack strikes at the lure, the vessel is stopped immediately and a few bait sardines or anchovies are thrown to bring the school to the surface. Fishing commences as soon as the skip-jack start taking bait. Otherwise, the vessel continues on its way, trolling and scouting for fish.

Hookless trolling jigs are also used to find fish. Lines to which these lures are attached are held in hand while trolling and if a strike is felt, the vessel is stopped and bait is broadcast. This method is said to have an advantage over the use of hooked jigs in that the striking fish is not caught. A hooked fish may frighten the rest of the school by its effort to get free or may discourage other fish from taking bait by trailing blood if it escapes.

Skipjack also make their presence known by leaving a wake which is easily discernible on a flat sea. Patches of smooth water ("slicks") on a ruffled surface are also regarded as general indications of subsurface skipjack schools. Jumping and rolling fish often guide fishermen to the schools.

METHODS OF APPROACHING SCHOOLS: Once a school of skipjack has been sighted, the problems of how best to approach the school arise. There are many different views on this subject, all of which vary with locality and with individual captains. The following approaches are considered to be the best, but conditions do not always permit their use.

1. Kagoshima fishermen opine that the most effective approach is to draw the school towards the portside of the boat

by chumming live bait, maneuvering the vessel so that the fish are between the sun and the vessel.

2. Fishermen from Mie Prefecture, who are considered as being among the foremost of Japanese skipjack fishermen, claim that the best way to contact a school is from downwind.

3. Shizuoka fishermen and those of neighboring prefectures like to intercept the head of the school on the portside of the vessel.

In short, it may be concluded that there is no standard way of approaching a school of skipjack. The approach depends upon the situation and on the discretion of the individual captain.

CHUMMING AND USE OF SPRAY SYSTEM: "Chumming," or the scattering of live bait, is an essential preliminary to actual fishing. By this means schools of skipjack are attracted to the vessel and fished. The chummer holds an important position among the crew and is usually a man with considerable fishing experience. Upon him rests the responsibility of luring the skipjack towards the fishermen, of effectively "holding" the fish near the vessel, and of using bait supplies judiciously so that waste is avoided. Large vessels with crews of 40 or more fishermen usually have two men broadcasting bait when fishing, one at the bow and one at the stern. Small skipjack boats employ a single chummer. In the latter case, the chummer generally stands forward of the bridge where the bait wells are located, above the level of the fishing platform so that he can chum over the heads of the fishermen. When chumming from stern, bait is brought in buckets to the chummer.

As the vessel approaches a school of skipjack, the chummer throws a few handfuls of live bait, from 50 to 60 fish. If the fish take the bait, additional handfuls are scattered into the area ruffled by the spray system until the skipjack gather near the boat, which is now allowed to drift. A suitable species of bait fish when used as chum will swim back to the vessel for protection so that they lure the skipjack towards the fishermen. As soon as the skipjack become frenzied in their efforts to take bait, artificial lures are used and chumming is reduced to a minimum. Only a dozen or so fish are thrown every now and then. However, the amount of bait used and the duration of chumming is governed by the behavior of the school. If the school is wary and the fish will not take lures, the fishermen use live bait on the hooks, and chumming is continued at the same time as long as the fish bite. Dead or ground chum has been found to be almost useless for the purpose of attracting skipjack.

Chumming is generally done by hand from a small dipnet. The bait is kept in a small box or tub which is kept supplied from the main bait wells. Water is not circulated through these tubs. Live bait is never chummed directly from the bait wells as is the case in the United States tuna fishery.

An important adjunct to chumming is the use of the spray system. This modern technique was developed exclusively by the Japanese and finds common use among all skipjack fishermen regardless of the size of vessel used. No comparable method is used in the American fishery except in the Hawaiian Islands where Japanese immigrants have introduced the spray system into the local fishery. Over 35 years ago, when the present day Japanese skipjack fishery was still fairly young, Japanese fishermen who fished from small hand-propelled boats found that better catches of skipjack could be made by agitating water around the boat with bamboo rakes and other crude contrivances. Water was also scattered from the bait tub. This technique was later

adopted by powered boats when they entered the fishery and it resulted in the development of the spray system.

The chief advantages cited for use of sprays are:

1. The spray ruffles the surface of the water so that the vessel and fishermen are hidden to the fish.
2. Water agitation excites the fish into taking artificial lures, thus conserving bait supplies.

Whether or not these contentions hold true is open to question, but the fact remains that Japanese fishermen are all thoroughly convinced of the efficacy of sprays in increasing catches of skipjack.

Spraying accompanies chumming as the vessel approaches a school of fish; however, some boats only spray when the school has been drawn to the boat. The spray is continually operated when fishing and is turned off only when the fish have dispersed. It is used regardless of weather and water conditions.

In the South Seas, a slightly different technique was frequently used in chumming live bait. When a school of skipjack was located, the vessel was maneuvered slowly past the school at a distance of about 75 feet. Bait was then thrown in the direction of the school and as the vessel proceeded, a careful lookout was maintained to see whether the skipjack diverged from their course to take the bait. If skipjack were seen to feed, the vessel circled in a direction away from the school and chumming was resumed as the school was approached; fishing then commenced. If the fish failed to rise, this procedure was sometimes repeated.

FISHING: Fishermen on the larger vessels are usually stationed on both sides; on smaller vessels, they fish from only one side (Figure 16), either port or starboard. The most experienced fishermen are placed at the bow and stern while the less experienced members are stationed amidships. This is to take advantage of the tendency of skipjack to congregate near the ends of the vessel. Those fishing along the bowsprit have to be especially agile because of their precarious position. Fishing is generally done from a standing position.

In live-bait fishing, the fishing pole is gripped with both hands and the butt of the pole is placed firmly against the thigh. Pads are often used by fishermen to protect themselves from the butt of the pole. The baited hook is placed in the band of water ruffled by the spray and the fisherman then sets himself for the strike, which has to be almost anticipated for the momentum of the fish in rushing at the bait is used to aid in bringing it aboard. When the fish is lifted from the water, it is swung through the air in such a manner that it can be caught underneath the left armpit of the fishermen with the head of the fish pointing out and the stomach up. This enables the fisherman to remove the hook quickly and at the same time prevents bruising of the fish. To catch a skipjack beneath one's arm is a highly skilled technique and generally requires years of practice before proficiency is attained. Boys who are planning to become fishermen are trained to do this in fisheries schools where they use wooden fish models for practice.

The American technique of fishing one hook with two poles has been adopted by Japanese fishermen for catching albacore and small yellowfin tuna up to about 50 pounds. There is no pole-and-line fishery for the larger fish as such. More often, however, fishermen continue to use one-pole lines and will assist each other in landing fish. When a man hooks a fish, the crew member on each side of him props

the tip of his pole under the one holding the fish, provided they are free to do so. All three men then bring the fish aboard together. This method has its advantage



FIGURE 16 - JAPANESE SKIPJACK FISHERMEN WORKING A SCHOOL OF FISH.

in that more lines can be fished at one time for a given amount of space. Dipnets may be used in landing large fish.

Aboard the vessel, each fisherman has a live box at his side which is built into the rail of the ship. These live boxes are connected to the spray system for water circulation, and are kept supplied with bait by "bait boys," youngsters who perform odd jobs aboard the fishing boat.

Various methods are used in baiting hooks, but the principle is the same—generally, fish are hooked in such a way that they will suffer the least injury and will be able to swim freely. Ordinarily, the hook is fastened through the head from beneath the jaws or through the back (Figure 17). Live bait is generally used when first fishing a school or when the fish are wary. If the skipjack become greatly excited, the fishermen quickly change over to artificial lures.

Artificial lures, usually feather jigs, are also worked in the band of water covered by the spray and are played on the surface. When a fish is hooked, it is jerked directly overhead so that the fish becomes unhooked in mid-air, and will fall behind the fishermen. This leaves the lure free to fish again. Since rebaiting is not necessary, the need for catching the fish is eliminated.

The vessel is usually allowed to drift with the wind and current while fishing, but in certain instances may be propelled slowly to keep up with the school. Deck scuppers are stopped with rags and waste to prevent blood from dripping into the water and discouraging fish from biting. Schools of skipjack which bite well may be fished as long as 30 minutes, during which time a 40-man crew can catch a maximum of 5 to 6 thousand skipjack or the equivalent of 20 to 25 metric tons. Schools once fished and lost may be refished, provided they can be attracted by chum.

Japanese skipjack fishermen, like all others of their profession, have certain beliefs, usually based upon experience, in regard to fishing conditions. A few of the concepts are:

1. Fishing is best after the passage of an atmospheric low pressure area.

2. Just before and after low and high water on the change of the tide.

3. A ruffled surface is conducive to good fishing.

4. Cloudy overcast weather is preferable to clear days.

5. In spring, an easterly wind is favorable for fishing; in fall, a westerly wind.

6. Skipjack which have brightly colored indigo backs bite better than do fish with pale backs. It was said that as the fish becomes excited, the color of the back brightens.

JAPANESE METHODS OF BAITING SKIPJACK HOOKS

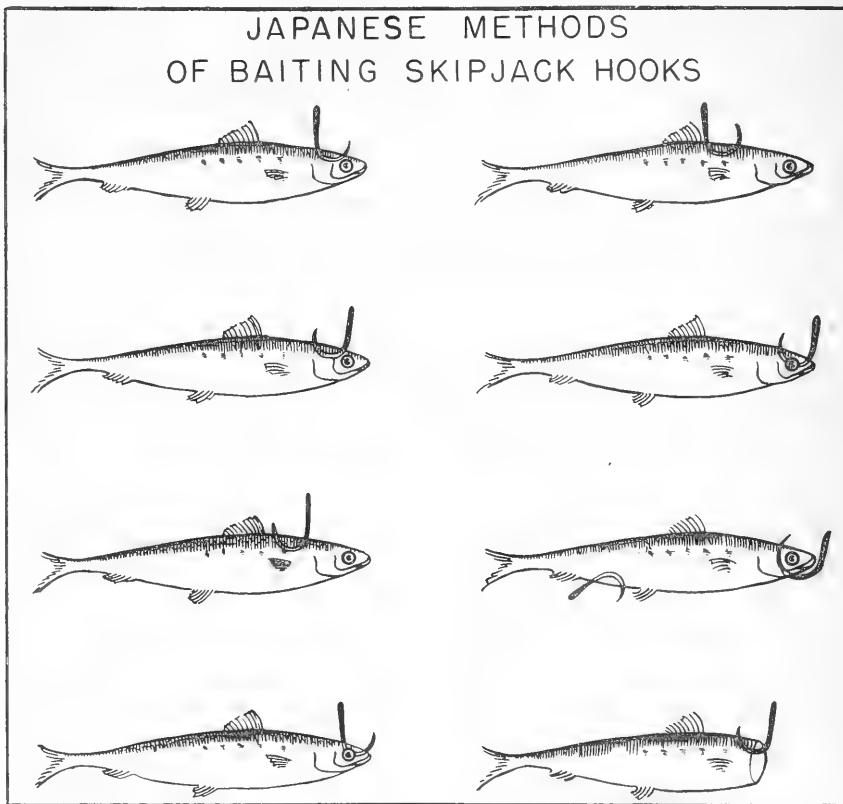


FIGURE 17

HANDLING OF CATCH

Because of the short duration of actual fishing time, catches are not stowed until the school has disappeared. When it is evident that fishing has ceased, all crew members, with the exception of the captain and lookouts, participate in icing down the catch. Since most Japanese fishing boats are not equipped with refrigeration systems, except for a few of the more recently built vessels, skipjack are preserved whole in crushed ice. Ice is loaded aboard the vessel in crushed form or in 200-pound blocks which are crushed with wooden mallets when needed. The fish are usually thrown from the deck into the hold where they are packed in ice. The amount of ice carried and fish-holding capacity depends upon the construction of the vessel, but in general, a 50-gross-ton vessel will carry about 15 tons of ice and will be able to handle 30 tons of fish.

Some fishing vessels use a combination of sea water and crushed ice in preserving their catches. This medium is often employed when bait wells are used as auxiliary fish holds. In this case, the holds are plugged. The fish are thrown into the ice-sea water mixture until the hold is full. Rice straw mats are then placed on top and covered with boards, which in turn are so braced that they will hold the fish and ice beneath the sea water.

Since insufficient care is frequently exercised in handling fish, catches are often in a poor condition by the time they reach port. This is especially true of small fishing vessels which have limited ice-carrying capacities. Coastal skipjack boats which go out for only a day or two do not carry ice. During peak seasons when large catches are being made, fishing boats will load up with as many fish as they can carry regardless of whether or not the fish can be adequately preserved. This results in poor quality fish. Also, skipjack fishing is best during warm weather so that unless careful precautions are taken to maintain the freshness of the fish, they will deteriorate rapidly. Under the present economic conditions in Japan where no premium is placed upon the quality of fish brought to port, the fishermen have no incentive to bring in fish in good condition. Thus far, they have had little trouble in disposing of their catches, fresh or stale.

In port, fish are unloaded from the vessel by hand. The fishermen form a line from the hold to the wharf and pass the fish two or three at a time along this line. Small fish under 5 pounds are handled in bamboo baskets. The landed fish are sorted on the pier into small, medium, and large sizes because the price of fish varies with size; the larger ones command the higher prices. After weighing, which is usually done with beam balances and baskets, the fish are either taken to processing plants for manufacture into dried fish sticks or are delivered to the fresh fish market.

FISHING GROUNDS AND SEASONS

GROUNDS: Fishing grounds in the Pacific Ocean to the east and south of Japan are arbitrarily broken down into four major areas, each of which is identified with some prominent landmark. These are from north to south, the Tohoku, Zunan, Kinan, and Satsunan areas. Projections of these four divisions to the east and south, and west in the case of the Satsunan region, are contained within the fishing area which is at present authorized by SCAP (Figure 18).

The Tohoku region, which is the most important of all skipjack fishing grounds from the standpoint of total catch, encompasses all waters north of an imaginary

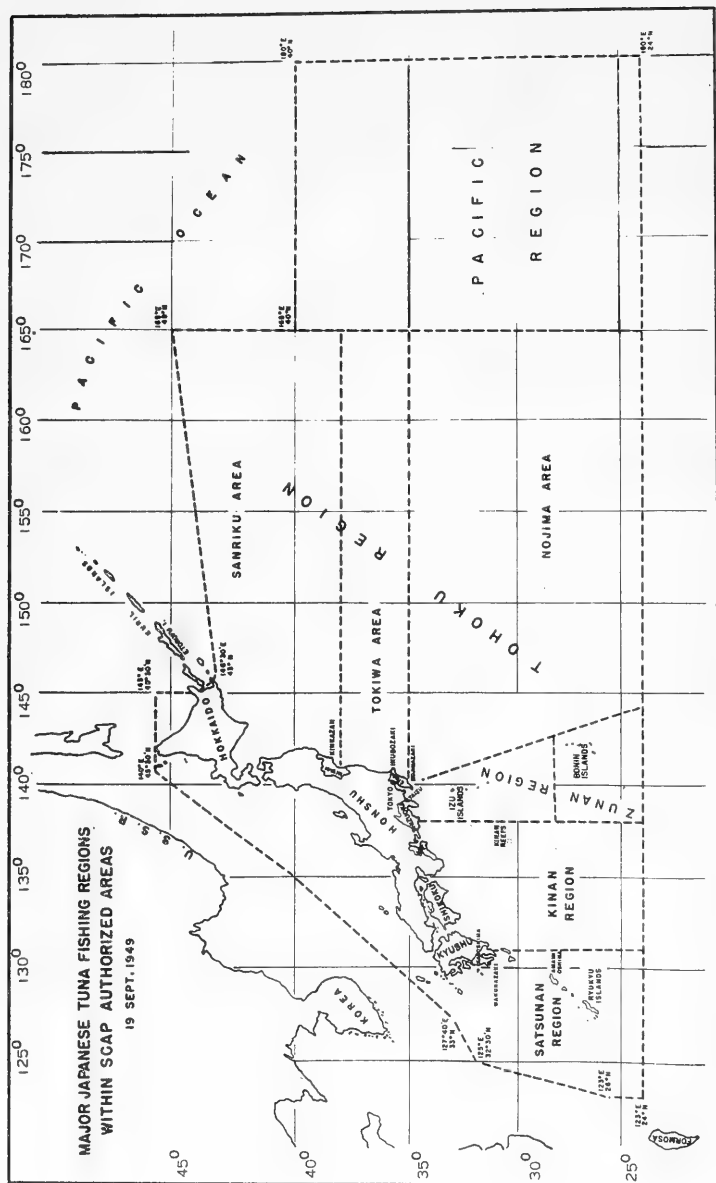


FIGURE 18

NOTE: AUTHORIZATION FOR THE OPERATION OF ONLY MOTHERSHIP-TYPE TUNA FISHING (SIMILAR TO THE ANTARCTIC WHALING EXPEDITIONS) IN THE AREA EXTENDING SOUTH FROM THE AUTHORIZED JAPANESE FISHING AREA TO THE EQUATOR WAS GRANTED BY THE SUPREME COMMANDER FOR THE ALLIED POWERS BY SCAPIN 2097 DATED MAY 11, 1950. THIS INCLUDES WATERS IN THE UNITED STATES TRUST TERRITORY AROUND THE CAROLINE ISLANDS, THE MARIANAS AND THE MARSHALL ISLANDS, BUT NOT THE GILBERT ISLANDS. (SEE COMMERCIAL FISHERIES REVIEW, JUNE 1950, PP. 52-4; JULY 1950, P. 46.)

line drawn in a south-southeasterly direction from Nojimazaki in Chiba Prefecture. This sea area is, in turn, subdivided into three smaller units: Sanriku, waters north of 38° north latitude; Tokiwa, 35° north latitude to 38° north latitude; and Nojima, waters to the south of 35° north latitude.

The Zunan region lies immediately south of the Tohoku region and has as its western limits 138° east longitude. The Izu and Bonin Islands, which are included in this division, form sub-regions of their own, being divided at approximately 28°20' east longitude.

The Kinan region lies directly off Shikoku and is delineated on the east by 138° east longitude and on the west by 131° east longitude.

Adjacent to Kinan on the west is the Satsunan region, which includes the northern Ryukyu Islands.

In Japan proper, there are a total of 20 or more prefectures which engage in skipjack fishing, most of which border the Pacific Coast. Of these, Miyagi Prefecture is usually the leading producer, followed closely by Shizuoka Prefecture farther to the south. The larger landings of Miyagi Prefecture are due to the strategic location of her ports in relation to the Tohoku area which is conceded to be the most productive of homeland fishing grounds for skipjack. Fishing vessels from Miyagi and nearby prefectures are able to exploit the numerous schools of skipjack which converge in Tohoku waters from July to October chiefly off Cape Kinkazan. Annual catches of these prefectures are therefore relatively higher than those situated elsewhere along the Japanese coast.

SEASONS: The Japan Current is assumed to be the controlling factor in the migration of skipjack from southern waters; therefore, it directly affects the yearly fluctuations of the fishery in Japanese waters. This warm-water system originates in the eastern Philippine Islands as a branch of the Equatorial Current. After flowing to the northeast of Formosa and passing through the Ryukyu Islands, the main current of the Japan Current proceeds northeast along the coasts of Kyushu, Shikoku, and Honshu until it reaches the vicinity of Inubozaki in Chiba Prefecture, approximately 37° north latitude. Here the Japan Current meets the Kamchatka Current (Oyashio), a cold current, coming along the coast from the north, and veers east to continue its way across the Pacific.

In the spring, with the rise in water temperature and the gradual extension of the Japan Current to the north, migratory skipjack schools start to appear in the Amami-Oshima region, south of Kyushu, in early February. As the season progresses, fishing around the numerous banks in northern Ryukyu waters improves and reaches a maximum in May and June. These banks are relatively shallow with depths of 100 fathoms or less. At this time, fishing vessels from as far as the northern end of Honshu move to southern Kyushu ports to engage in the fishery. The schools continue to proceed north with the Japan Current so that the centers of fishing activity gradually shift from the Satsunan region north to the Kinan and Zunan regions. It is believed that the fish which enter Japanese waters along the Ryukyu chain of islands are joined off eastern Kyushu and Shikoku by skipjack which have migrated from the south along the Kinan reefs. Schools which are abundant in May in the Kinan region are said to decrease markedly in number during the latter part of June, when they presumably join the northward migration. Skipjack from the Zunan region, which first appear near Torishima, are also numerous in May and June, and a part of these schools are said to travel northward in July; the rest remaining in the area

until autumn. In July and August, with the Japan Current reaching its maximum development and making its influence felt as far north as the southern Kurile Islands, approximately 46° north latitude, the migrating schools of skipjack converge in an area 150-200 miles east of Kinkazan in Miyagi Prefecture. Since further movement to the north is barred by the presence of the Kamchatka Current with its cold temperatures, the schools remain in the Tohoku area and provide excellent fishing until September. Occasionally, some schools ascend as far north as Etorofu Island, immediately north of Hokkaido.

With the gradual decrease in temperature in September, the Japan Current is deflected farther south and is weakened as the cold Kamchatka Current becomes dominant. At this time, the skipjack schools disappear. Where they go and by what routes is still unknown although various views are held on this subject. Some schools are said to have been seen returning southward about 300 miles offshore, presumably to their areas of origin; these schools have been fished. Not a few investigators contend that the skipjack travel due east at greater depths to complete a circular migration to the South Seas, possibly by way of the Hawaiian Islands and Central America. As evidence, they point to the fact that skipjack are often caught by the winter long-line fishery operating 1,500 miles east of Japan and at depths not normally fished for skipjack, approximately 300 feet. However, skipjack taken by these long-lines are usually much larger than those ordinarily caught in Japanese waters.

The so-called "resident schools" may be fished throughout the year around the Bonin, Izu, and Ryukyu waters. Fishing operations usually cease during the mid-winter months because of unfavorable weather and lack of bait. In addition, "resident skipjack" are not very abundant during the winter, and never furnish the highly productive fishing which is found during the warmer months.

SOUTH SEAS: In the former Mandated Islands region, fishing for skipjack was limited for the most part to waters proximate to the widely scattered major fishing bases of Palau, Saipan, Truk, Ponape, and more recently Kusaie and Yap, although it was recognized that there were other potential fishing grounds of importance. Since the fishing boats were of small size, ranging up to 25 and 30 tons, the fishermen usually fished outlying reefs and banks and rarely ventured more than 50 miles from land. Furthermore, trips were limited to a day's duration because it was impossible to keep bait alive for any length of time, not to mention the difficulties of maintaining the quality of fish under prevailing climatic conditions.

Weather conditions for fishing are generally ideal throughout the year in the low north latitudes, except from November to February when the northeast trade winds prevail. Although it is possible to catch skipjack during all seasons, fishing usually slacks off in January and February. The period from May to September is reported to provide the best fishing for skipjack.

OTHER FISHING GROUNDS: Although the Japanese at one time exploited skipjack resources of the Indo-Pacific and Philippine regions, detailed information regarding their areas of operation are lacking. However, the general location of fishing grounds in these two regions is presented in "The Japanese Tuna Fisheries" (Shapiro 1948).

ACKNOWLEDGMENTS

Travel and study in Japan were performed under the auspices of the Supreme Commander for the Allied Powers. The Natural Resources Section under Lt. Col. Hubert G. Schenck, and particularly the Fisheries Division of this Section under William C. Herrington, were largely responsible for the success of the investigation of Japanese tuna research and fishing methods. Dr. K. Kuronuma and S. Takayama of the Central Fisheries Experiment Station in Tokyo, and Dr. Y. Hiyama of Tokyo University were helpful in numerous ways.

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U. S. PACK OF TUNA AND TUNA-LIKE FISH

DO YOU KNOW

That the 1949 United States pack of tuna and tuna-like fish, which amounted to 7,290,320 cases (141,700,593 pounds), valued at \$97,710,325, was 252,562 cases greater than the 1948 production. However, canners received nearly 15 million dollars less for the pack in 1949 than in the previous year.



October 1950

ANALYTICAL METHODS: The effect of extraction of fish meal with mixtures of water and acetone was investigated with respect to the optimum ratio of acetone to water. It was found that the greatest amount of ethyl-ether-soluble material was extracted with a mixture of 75 percent acetone and 25 percent water. When the proportion of water was increased or decreased, lesser amounts of ethyl-ether-soluble material was obtained. When the amount of water was increased, a greater amount of total extract was obtained, but the ethyl-ether-purified extract was less than with the 75-25 acetone water solution.

* * *

PRESERVATION: Samples of the salmon eggs preserved on a large scale during August and September at Ketchikan were examined. It has been found that those samples in which one of the preservative ingredients was sodium chloride are not keeping well. Furthermore, feeding tests carried out at Leavenworth during the past summer indicated that laboratory-preserved samples, in which salt was one of the preservative ingredients, have inferior nutritive value as compared to those samples preserved without salt.

* * *

FRESH FISH: Another species of rockfish, *S. miniatus*, (also known as vermilion rockfish) was obtained by the Exploratory Fishing Section's vessel John N. Cobb for a palatability test. Although the skin of this fish has a rather inferior appearance since it is mottled with grayish streaks, the general appearance is quite similar to the red rockfish (*S. ruberimus*). Because of this mottled appearance, the fishermen have been accustomed to discarding it at sea. In the palatability test carried out on this species it appears that it is just about equivalent to the *S. ruberimus* in initial palatability.

* * *

COMPOSITION: Preliminary plans were made for collecting a large number of samples of pilchard meal, stickwater, and other products in California for later analysis of Vitamin B₂ and other vitamins by microbiological methods. Several hundred sample bottles were procured and labeled and tentative schedules were drawn up for procuring fish meal at times when it is hoped that the fish-meal plants will be in operation in various California areas. It is planned to procure samples of the raw meal, the semi-finished product (cooked fish, press cake, etc.), the final meal and condensed fish solubles in order to determine the effect of processing on destruction of Vitamin B₂. It is also planned to obtain from commercial dealers a sufficiently large number of pilchard meals (probably more than 100) in order to determine the range of Vitamin B₂ content of this product ordinarily met in commerce.

* * *

CANNING: Additional samples of gill-net albacore tuna were brought to Seattle by the exploratory vessel John N. Cobb. Some of the samples were iced immediately after catching and then frozen one week later; while others were frozen right after being caught. Final arrangements were made for having these fish, and the others previously obtained, canned at a custom cannery in Astoria.

* * *

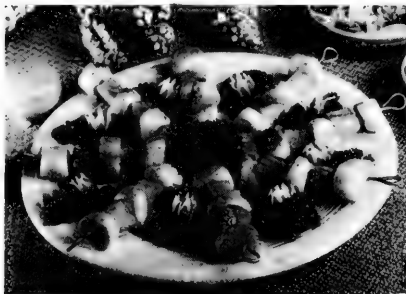
REFRIGERATION: After six months of storage at 0° F., oysters treated with dips and glazes of ascorbic acid and with water only were still considered satisfactory. Although considerable variation had occurred from month to month, due possibly to differences in individual oysters, no one lot receiving a particular treatment had consistently stood out as being superior or inferior. As is generally true with frozen oysters, appreciable quantities of free liquor had formed upon thawing the oysters.

* * *

A series of frozen whole Dungeness crabs were prepared for a study of the effect of freezing the crabs (cooked and raw) in order to obtain information as to the feasibility of freezing whole crabs aboard a vessel or freezing raw crabs at the production weak in the plant.



SCALLOP AND PINEAPPLE KABOBS



1 POUND SCALLOPS
4 TABLESPOONS BUTTER
6 TABLESPOONS BROWN SUGAR
1/2 CUP PINEAPPLE JUICE - (FROM THE CHUNKS)

PINEAPPLE CHUNKS
1 TEASPOON SALT
DASH PEPPER

Melt butter, add brown sugar, seasonings, and pineapple juice. Dip each scallop in the mixture and arrange alternately with pineapple chunks on the skewer. Place skewers across baking dish and bake in hot oven 350° for 30 minutes. Baste twice during cooking. Serve on skewers. Serves 6.

A Fish and Wildlife Service tested recipe. This is one in the series of recipes using fishery products tested and developed in the Service's test kitchens.



TRENDS AND DEVELOPMENTS

Branch of Commercial Fisheries Program for Fiscal Year 1951

The Branch of Commercial Fisheries of the U. S. Fish and Wildlife Service is concerned with the activities and welfare of the commercial fisheries in the United States and its Territories. Functions of the Branch include:

- (1) Investigations to improve and develop methods for catching, handling, preserving, storing, and transporting fishery products and byproducts.
- (2) Determination of the composition, properties, and nutritive value of fishery products and byproducts.
- (3) Development and improvement of fish-cookery and preservation methods.
- (4) Studying problems of sanitation and plant operation.
- (5) Exploratory fishing to determine character and extent of resources, and to test, devise, and demonstrate the most effective gear and vessel types.
- (6) The collection, analysis, and dissemination of statistics on the production, processing, and storage of fishery products.
- (7) Conducting a Fishery Market News Service for the collection, publication, and dissemination of current information on fishery commodities.
- (8) Conducting an educational service to promote the free flow of fishery products in commerce and disseminate fisheries information.
- (9) Developing and increasing markets for domestic fishery products by conducting fishery promotional programs and assisting the industry in overcoming problems of production and distribution.
- (10) Economic research on costs, employment, labor, and prices in the fishery industries.
- (11) Collection of data on the activities of fishery cooperatives as required to assure their conformity with the provisions of the Fishery Cooperative Marketing Act of 1934.

For administration and operational purposes, the Branch is divided into six sections: Statistical; Fishery Market News; Technological; Economics and Cooperative Marketing; Exploratory Fishing and Gear Development; and Educational and Market Development.

The Branch's program by sectional functions, for the Fiscal Year 1951 (July 1, 1950-June 30, 1951), developed in accordance with the amount of funds appropriated by the Eighty-First Congress, is as follows:

STATISTICAL SECTION: Collects and publishes economic and biological data on the yield and value of our commercial fisheries, production of manufactured products, employment of fishermen and fishing craft, quantity of gear operated, and related

information. Also operates a consulting service for the fishery industries and government agencies requesting statistical data of the fisheries.

The field offices of the Statistical Section and their activities are:

Boothbay Harbor, Maine: Collects monthly data on landings of fishery products in Maine in cooperation with the Maine Department of Sea and Shore Fisheries. Conducts such additional surveys as are necessary to complete an annual general canvass of the fisheries of Maine and New Hampshire.

Gloucester and Provincetown, Mass.: Collect detailed daily information on landings of fishery products at the important Massachusetts ports of Gloucester, Boston, and New Bedford, and ports on Cape Cod, by species, gear, and area of capture. Data are collected in cooperation with the Market News Section and the Service's Branch of Fishery Biology. Conducts an annual general canvass of the fisheries of Massachusetts and Rhode Island.

New York, N. Y., and Toms River, N. J.: Agents stationed in these ports conduct the annual fisheries canvass of New York, New Jersey, Delaware, and Connecticut. The New York Conservation Department cooperates by providing an employee to assist in the collection of Long Island fisheries statistics. The Connecticut State Board of Fisheries and Game also provides an employee to assist in the work in that State.

Weems, Va.: Conducts general canvass surveys of the States of Virginia and Maryland. In Maryland, the Department of Tidewater Fisheries cooperates by collecting the major portion of the catch data for that State.

Beaufort, N. C.: An agent is being assigned to Beaufort this year to conduct the general canvass surveys of the fisheries of North Carolina, South Carolina, and Georgia. Surveys have not been conducted in these States since 1945. A cooperative arrangement is being entered into with the State of North Carolina for the purpose of developing a system for the collection and publication of current fishery statistics for that State.

Miami, Fla.: An agent is being assigned to Miami this year to survey the fisheries of Florida which have not been canvassed since 1945. A cooperative agreement is being entered into with the University of Miami and the State Conservation Department for the collection and publication of monthly and annual statistics on the fisheries of Florida.

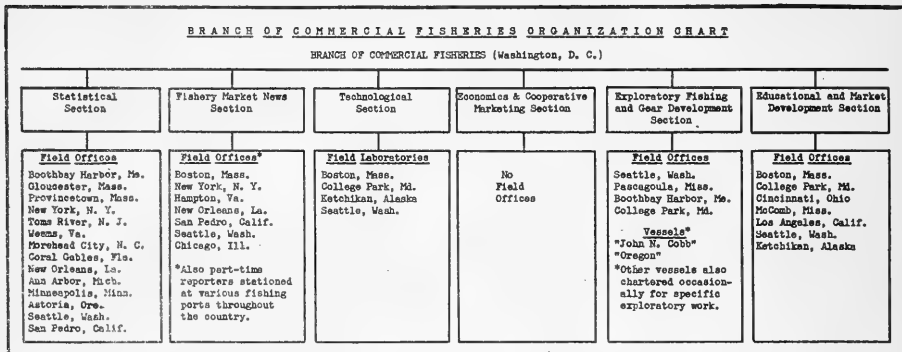
New Orleans, La.: The two agents stationed at this port are responsible for conducting general canvass surveys of the fisheries of Texas, Louisiana, Mississippi, and Alabama on the Gulf, and for the fisheries of the Mississippi River and its tributaries below the junction of the Mississippi and the Ohio Rivers.

Ann Arbor, Mich.: An agent is to be stationed at Ann Arbor, Mich., for the purpose of conducting a general canvass of the fisheries of the Great Lakes. Complete data on the fisheries of the Great Lakes have not been collected since 1940.

Minneapolis, Minn., or LaCrosse, Wis.: An agent will be stationed at one of these cities to conduct a general canvass of the fisheries of the Mississippi River and its tributaries above the junction of the Mississippi and Ohio Rivers. A canvass of this area has not been conducted since 1931.

Seattle, Wash.: From this office, a general canvass is conducted for the States of Washington and Oregon. In cooperation with the Market News Section, it is planned to station an employee at Astoria, Oregon, to assemble current data on the fisheries of the Columbia River.

San Pedro, Calif.: Conducts a general canvass of the fisheries of California.



The Statistical Section plans to issue the following statistical reports and bulletins from the Washington office during the year:

1. Fish Meal and Oil: A monthly bulletin. Contains data on the production of various kinds of fish meal and oil.
2. Frozen Fish: A monthly bulletin and annual summary. Contains information on freezings and cold-storage holdings of domestic fishery products in United States, Alaskan, and Canadian cold-storage plants.
3. Maine Landings: Monthly and annual. Contains data on the Maine catch by gear.
4. Massachusetts Landings: Monthly and annual. Contains data on the landings of fishery products by species, gear, and area of capture at the more important Massachusetts ports.
5. Texas Landings: Monthly. Contains data on the landings of fishery products at Texas ports by species, gear, area of capture (bay or gulf), and area in which the products were landed.
6. Alabama Landings: During the year it is planned to begin issuing, in cooperation with the Alabama Department of Conservation, a monthly report on receipts of fishery products at Alabama ports.
7. Florida Landings: During the year it is planned to begin issuing, in cooperation with the Florida State Board of Conservation and the University of Miami, a monthly report on receipts of fishery products at Florida ports.
8. Canned Fish and Byproducts: An annual bulletin. Contains detailed information on the 1949 packs of canned fishery products by can sizes, styles of pack, and areas of production, and data on the yield of fishery byproducts by areas of production.

9. Packaged Fish: Annual bulletin. Contains detailed information on the 1949 production of fresh and frozen fillets, steaks, etc.
10. Fishery Statistics of the United States, 1947: A detailed annual report. Gives information for all sections of the United States and Alaska on employment in the fisheries, the number of craft engaged, quantity of gear used, the volume and value of the catch, production of manufactured fishery products, and United States foreign trade in fishery products. It is planned to also issue the 1948 edition during the year.
11. Regional Statistical Summaries: Annual bulletins containing summary information for 1948 and 1949 on the operating units engaged in the fisheries and the volume and value of the catch will be released for various sections of the country as rapidly as the information becomes available.
12. Imports and Exports: An annual bulletin. Contains 1950 statistics on the United States imports and exports of fishery products.
13. Manufactured Fishery Products: An annual bulletin. Contains detailed data on the 1948 production of manufactured fishery products.

FISHERY MARKET NEWS SECTION: Collects, publishes, and disseminates on a daily basis current information on production, receipts, supply, demand, market, prices, cold storage holdings, and imports of fishery products. In addition, current news on fisheries trends in the United States and in foreign countries is published.

Field operations are carried out by seven field offices located in Boston, Mass.; New York, N. Y.; Hampton, Va.; New Orleans, La.; San Pedro, Calif.; Seattle, Wash.; and Chicago, Ill. Most of these field offices have full-time and part-time reporters working in the various fishing centers in the United States and Alaska gathering market news data.

This year it is planned to strengthen the Chicago and New Orleans field offices by adding another fishery marketing specialist at each office. On the Pacific Coast, market news data for the principal Oregon fishing ports has not been collected for a number of years. In order to collect daily production data for the most important Oregon fishing ports, it is planned to establish a field station at Astoria, Oregon, under the supervision of the Seattle field office.

The Fishery Market News Section issues daily Fishery Products Reports from Boston, New York, Hampton, New Orleans, San Pedro, Seattle, and Chicago. In addition, these offices compile and issue Monthly and Annual Summaries of the data collected. These reports are available free upon request.

From the headquarters office in Washington, D. C., the Section publishes a monthly periodical, Commercial Fisheries Review. This publication features articles on fisheries; news of trends and developments in the fishery industries of the United States and its territories, and foreign countries; and Federal Government orders and rulings affecting the fisheries.

TECHNOLOGICAL SECTION: The Section is primarily concerned with research and development on the proper utilization of fishery products. Its program includes research studies on fisheries in the fields of nutrition, refrigeration, byproducts, sanitation, and preservation. Field operations are carried out by field laboratories located in Boston, Mass.; College Park, Md.; Ketchikan, Alaska; and Seattle, Washington. The Section's detailed program for the Fiscal Year 1951 is outlined in a Technological Supplement of the November issue of Commercial Fisheries Review.

ECONOMICS AND COOPERATIVE MARKETING SECTION: This Section provides assistance in the administration of the Fishery Cooperative Marketing Act of 1934, and conducts fishery economic research. The administration of the Fishery Cooperative Marketing Act involves correspondence and personal conferences with members and officers of more than 70 existing fishery cooperative associations in conformity with the provisions of the Act.

Fishery economic research is mainly conditioned by current problems prevailing in the fishery industries. The research work extends especially to the cost factors involved in production and distribution of fishery products. The main cost factors are labor and transportation. Studies are being made to evaluate increasing transportation rates of all types of carriers on the fishery industries.

Other studies involve the effect of collective bargaining contracts, wage and hour legislation, social insurance, and social insurance taxes upon the fishery industries.

Studies also are made on the effects of international trade and international policies upon the domestic fishery industries. The effects of imports and exports, the effect of the ECA program upon the fishery industries, the effect of currency changes in foreign countries, and the effects of certain economic legislation in foreign countries are observed. In this connection, data are analyzed for use in formulating recommendations to the Trade Agreements Committee with respect to fishery items.

During this fiscal year, intensive studies will be inaugurated to provide reliable information on the economic well-being of the fishery industries through detailed series of statistical data on prices of fishery products and income of fishermen.

A general advisory service on fishery economics, which may be used by members of the industry, by other Governmental agencies, or by members of Congress or State Legislators, is also maintained.

EXPLORATORY FISHING AND GEAR DEVELOPMENT SECTION: It is the function of this program to assist the fishing industry by locating new productive fishing areas, determining their potentialities for commercial fishing, and developing improved methods of capturing the fish located.

During the fiscal year 1951, there will be three separate field areas of exploratory fishing: one in the North Pacific, one in the Gulf of Mexico, and one in the New England area. In addition, a project involving basic gear research will also be conducted.

North Pacific Exploration: Although the North Pacific area extends from waters off of Oregon and Washington to the northern boundaries of the Bering Sea, much of the exploratory fishing in this area will be directed toward the development of the fishery resources of Alaska. The present valuable commercial fishing industry of Alaska is based primarily on the salmon, herring, and halibut fisheries which have been developed and are being utilized to a relatively high degree. It appears that further profitable expansion in the Alaskan fisheries must come from the development of the lesser-known, but potentially valuable, fishery resources which are either unused or prosecuted at levels far below those consistent with the wise management of a fishery resource. The development of these new fisheries is the aim of the exploratory fishing operation.

The vessel John N. Cobb was designed and built specifically for the exploratory fishing operations and was delivered to the Service early in the calendar year 1950.

Exploratory work planned for the John N. Cobb in the North Pacific area includes:

1. A continuation of the albacore tuna survey.
2. A search for new flatfish fishing areas.
3. An attempt to locate shrimp and scallops in commercial quantities, and to aid in the development of this fishery.
4. A continuation of the king crab survey.
5. A survey of general sea areas which have not been fished.
6. Testing and evaluating the efficiency of new-type fishing gear.
7. Adapting new electronic equipment to commercial fishing.

Of the operations proposed above, items 1, 3, and 6 have been given first priority for the balance of fiscal year 1951.

Gulf of Mexico Exploration: By means of Public Law 163 (Eighty-First Congress), the vessel Oregon was made available to the Service for exploratory fishing work in the Gulf of Mexico. The vessel was reconditioned as an exploratory fishing vessel and made its first exploratory fishing trip on April 17, 1950. Since that time, the vessel has been engaged steadily in an exploratory survey in the Gulf area. The primary emphasis so far has been upon a search for new deep-water shrimp grounds, with good indications of success.

The exploratory fishing program for the Gulf of Mexico includes:

1. A continuation of exploration of new deep-water shrimp grounds.
2. A survey to determine the possibilities of establishing a commercial tuna fishery.
3. Locating and devising efficient methods for capturing live bait for tuna fishing.
4. A search for menhaden in areas other than those now fished.
5. Testing of new-type fishing gear.

It is anticipated that, of the projects mentioned above, most of the emphasis for Fiscal Year 1951 will be on items 1 and 2.

New England (Bluefin Tuna) Exploration: An exploratory fishing investigation of the bluefin tuna resources in the North Atlantic, adjacent to the New England area, is planned, with the actual fishing operation to begin about May 1951. This is the first year that funds have been available for this work. The necessary arrangements for procurement of a vessel, gear, equipment, fishing crew, and a supervisory organization are now in progress. The necessary research into background problems entering into the investigation is being made, as a basis for the exploration when undertaken.

The objectives of the bluefin tuna exploration are as follows:

1. Locate bluefin tuna and determine abundance.
2. Determine most efficient method of capturing commercial quantities of tuna.

3. Determine effectiveness of fishing gear which may be used by the existing New England fleet without extensive conversion of vessels. (Consideration to be given to use of purse seines, long lines, gill nets, trolling lines, trammel nets, traps.)

Gear Development and Research: In conjunction with the three actual exploratory fishing operations conducted by the Service, it has been found desirable to undertake special research to analyze and develop new or improved methods of fishing and fishing gear. This work is headquartered at the Service's College Park, Md., laboratory. It is anticipated that this project will prove of great value in solving some of the theoretical and practical problems connected with the development and application of new and improved fishing gear for the benefit of the commercial fishing industry.

Comprehensive projects are scheduled for this program, but the major items upon which attention will be focused are:

1. Improvement and development of menhaden fishing methods.
2. Improvement and development of mackerel fishing methods.
3. Compile all available information regarding fishing gear for basis of fundamental research.
4. Improvement and development of trawling gear.
5. Study problem of substitute fishing-gear materials for use during periods of shortages.
6. Test and develop new materials for gear.
7. Test the feasibility of the Danish Floating Trawl in menhaden fishery.
8. Investigate possibility of capturing phototropic fish.
9. Develop methods of utilizing mid-oceanic fisheries.

Initially, priority has been given to item 1.

EDUCATIONAL AND MARKET DEVELOPMENT SECTION: Funds for conducting the activities of the Educational and Market Development Section are obtained by transfer from the Department of Agriculture. The objective of the program is to promote the free flow of domestically-produced fishery products in commerce by conducting a fishery educational service and to develop and increase markets for fishery products of domestic origin.

Educational Service Activities: Headquarters are in Washington, D. C.; with field offices in Seattle, Wash.; Boston, Mass.; and College Park, Md. The program consists of:

1. Development of visual and other educational material, such as, educational pamphlets, motion pictures, displays, posters, graphic material, and educational material for use in broadcasting, telecasting, and by the press.
2. Informing industry of new or more efficient methods of production, through such facilities as a monthly fisheries technical abstracting service (Commercial Fisheries Abstracts), educational bulletins, and personal consulting services.
3. Improve national fish cookery as a means of obtaining increased consumption by preparing better fish cookery methods, issuing reports and cookbooks, and demonstrating approved methods.

4. Sponsoring and stimulating commercial fishery courses at educational institutions to impart knowledge of fundamental subjects at trade levels and to obtain better trained people for commercial fishery work

Market Development Activities: Headquarters are established in Washington, D. C., and field offices in Boston, Mass.; Cincinnati, Ohio; McComb, Miss.; Los Angeles, Calif.; Ketchikan, Alaska; and College Park, Md. The program consists of:

1. Stimulating the use of fish in the Federally-supervised school-lunch program by demonstrating the qualities of fishery products and arousing a zest for fish in youngsters which will carry on through later years. (Fish cookery demonstrations, information on supply, and educational materials are the principal means used.)
2. Stimulating the use of fish in frozen food lockers.
3. Analysis and forecast of fishery marketing conditions through monthly availability reports for institutional groups, plentiful foods statements, and a quarterly report (Quarterly Outlook for Marketing Fishery Products).
4. Marketing aids, such as lists of buyers, buyer's guide, timely market development bulletins, press releases on fishery products, and work with retailers.
5. Personal consulting services and interchange of information between various fishery areas and a study of foreign markets for United States products.



Additions to the Fleet of U. S. Fishing Vessels

A total of 73 vessels of 5 net tons and over received their first documents as fishing craft during August 1950--32 less than in August 1949. California and Washington led with 8 vessels each, followed by Florida with 7 vessels, according to the Treasury Department's Bureau of Customs.

Vessels Obtaining Their First Documents as Fishing Craft, August 1950					
Section	August		Eight mos. ending with August		Total
	1950	1949	1950	1949	
	Number	Number	Number	Number	Number
New England	2	5	22	25	35
Middle Atlantic	6	4	36	38	44
Chesapeake Bay	10	5	60	49	87
South Atlantic and Gulf .	31	38	214	243	369
Pacific Coast	17	46	187	262	327
Great Lakes	3	2	9	31	38
Alaska	3	4	71	75	96
Hawaii	1	-	3	3	5
Unknown	-	1	-	1	1
Total	73	105	602	727	1,002
Note: Vessels have been assigned to the various sections on the basis of their home port.					

During the first eight months of 1950, a total of 602 vessels were documented, compared with 727 during the same period in 1949.

Fifty of the vessels receiving their first documents as fishing craft during August were built during 1949 and 1950. The remainder were built prior to 1946.



Branch of Commercial Fisheries Expands Collection of Fisheries Statistics

Because the Branch of Commercial Fisheries received an increase in its 1951 fiscal year appropriations for statistical activities, the Branch's Statistical Section will be able to resume statistical surveys in the South Atlantic, Great Lakes, and Mississippi River areas; as well as expand the collection of statistical data on the Pacific Coast.



It is planned to establish statistical field offices at Morehead City, N. C.; Miami, Fla.; Ann Arbor, Mich.; and at points in the upper and lower Mississippi River areas.

General canvass surveys will be conducted in the areas mentioned for 1950 data on the number of fishermen and fishing craft; quantity of fishing gear operated by commercial fishermen; volume and value of the catch; and production of manufactured fishery products.

The 1950 survey will be the first complete one of the South Atlantic States since 1945; of the Great Lakes since 1940; and of the Mississippi River and its tributaries since 1931.



Federal Purchases of Fishery Products

DEPARTMENT OF THE ARMY, August 1950: The considerable increase in the purchases of fresh and frozen fishery products by the Army Quartermaster Corps during August reflected the increased food requirements of the Armed Services since the beginning of the Korean conflict in June. August purchases for the U. S. Army, Navy, Marine Corps, and Air Force for military feeding totaled 2,946,230 pounds (valued at \$1,193,198) --the highest quantity and value of fresh and frozen fishery products purchased by the Army Quartermaster Corps for any one month since January 1948. Purchases this August were higher than for July by 122.2 percent in quantity and 126.2 percent in value; and higher than in August 1949 by 68.2 percent in quantity and 135.6 percent in value (see table).

Purchases of Fresh and Frozen Fishery Products by Department of the Army (August and the First Eight Months, 1949 and 1950)							
Q U A N T I T Y				V A L U E			
August		January-August		August		January-August	
1950	1949	1950	1949	1950	1949	1950	1949
lbs.	lbs.	lbs.	lbs.	\$	\$	\$	\$
2,946,230	1,751,935	10,638,657	11,089,988	1,193,198	506,464	4,412,253	3,636,905

For the first eight months this year, total purchases were still below the corresponding period a year ago by 4.1 percent in quantity, but they were 21.3 percent higher in value. However, with the contemplated expansion of the Armed Forces, purchases of fresh and frozen fishery products for the balance of 1950 will probably continue at the August rate and total purchases this year no doubt will exceed those for 1949 and 1948.



Gulf Exploratory Fishery Program

"OREGON" TRAWLS FOR SHRIMP NEAR MOUTH OF MISSISSIPPI (Cruise No. 4): The Oregon on its Cruise No. 4 (September 11-26) trawled for shrimp in the area near the mouth of the Mississippi River between the 88th and 91st meridians.

Observations on Grooved Shrimp: Following a short period of strong winds at the beginning of September, the Oregon, the Service's Gulf Exploratory Fishery Program vessel, encountered bottom water temperatures in 30 to 50 fathoms that were generally a few degrees lower than in the preceding period. The larger (16-count and larger, heads-on) brown shrimp, Peneus aztecus, were found to be most abundant in 32 to 34 fathoms; that is, in water somewhat shallower than in the preceding period. The vessel caught 12- to 16-count heads-on shrimp for 11 hours in 32 to 34 fathoms, about 15 miles west to west by south of Southwest Pass at the mouth of the Mississippi River, on the night of September 14, at a rate of 240 pounds per hour. The depth, distribution, and size of the shrimp were apparently the same in the areas immediately east and west of the mouth of the river, but in September the concentrations appeared to be greater west of the mouth. Although the brown-grooved shrimp is known to inhabit deeper water, none were taken by the Oregon in more than 46 fathoms during September. In this September cruise, as well as in the July-August cruise, the largest shrimp were found in the deepest water with slightly smaller shrimp a few fathoms shallower. However, examination of all of the information available from these cruises shows a closer and more consistent relation between bottom water temperature and size of the shrimp than between depth and size. Studies are being continued on movements of populations of shrimp.

The population of larger brown shrimp is outside the area now being worked by the shrimp fleet but is within range of the larger vessels of the fleet and can be worked with only small modification of the rigs (increase in trawling cable length) used in the locality.

Miscellaneous Observations: Comparatively little bottom suitable for trawling was found near the mouth of the Mississippi in depths from 50 to 150 fathoms. One drag of 45 minutes duration in 195 fathoms with a 40-foot shrimp trawl produced 60 pounds of 28-count, head-on, red shrimp, Hymenopeneus robustus, along with 61 pounds of scrap.

While a shrimp trawl was being pulled on deck from 258 fathoms on September 23, a school of tuna, not identified as to species, came to the surface around the Oregon briefly and sounded, accompanied or followed by silky sharks. Trolling was not successful. The surface temperature was 83.5° F., the temperature at 50 feet 84.5° F., and at 100 feet 77° F. Observations such as this suggest the possibility that stocks of tuna may exist in the north Gulf but that they are confined to cooler layers of water below the surface unless driven upward by unusual circumstances.



Hampton Market News Service Office to Remain Open

Because the amount of the reduction in the 1951 appropriations applicable to the Market News Section of the Service's Branch of Commercial Fisheries was less than anticipated and because of certain savings which have been effected to date, there will be sufficient funds available for the Hampton Market News Service office to continue in operation at least until April 1, 1951. The closing of this office on September 29 was announced early in that month when it seemed that the proposed cut in appropriations would necessitate such a procedure. Although it is hoped that additional savings will make it possible to keep this office open during the last quarter of this fiscal year (July 1, 1950--June 30, 1951), it is not feasible at this time to make a definite statement since rising fixed costs for supplies and operations may be more than expected at present.

The cut in appropriations announced by the Budget Bureau on October 10, totaling \$580,271,335 for 31 Government departments and agencies, was ordered by Congress in the Omnibus Appropriation Act for 1951.

As in the past, the Hampton Market News Service office will continue as usual to collect daily production data, and issue daily Fishery Products Reports and summaries. This office collects data for certain areas in Virginia (Hampton Roads area, Lower Northern Neck, York River, and Eastern Shore areas), Maryland (Crisfield, Cambridge, and Ocean City areas), and North Carolina (Atlantic, Beaufort, Morehead City, Southport, Englehard, and Pamlico County areas). Charles D. Stewart will continue to supervise the operations of the office.

1/COMMERCIAL FISHERIES REVIEW, SEPTEMBER 1950, P. 27.



Inter-American Tropical Tuna Commission^{1/} Now Functioning

The Inter-American Tropical Tuna Commission convened for its first meeting in Coronado, California, July 18, 1950. Commissioner Jose Cardona-Cooper, representing Costa Rica, and Commissioners Lee F. Payne and Eugene Bennett, representing the United States, were present at the meeting. Commissioners Virgilio Aguiluz of Costa Rica and Milton C. James of the United States were not present.

Jose Cardona-Cooper was elected chairman and Milton C. James as secretary for the first fiscal year (1951). Matters pertaining to the organization and financing of the Commission were discussed at this first meeting. Details of the program will be announced prior to the next meeting of this Commission.

The convention for the establishment of this Commission was signed at Washington May 31, 1949, by the United States of America and the Republic of Costa Rica, and was ratified later by both countries. Implementing legislation has already been signed by the President of the United States.

The American members of the Commission were appointed by the President of the United States, acting upon the recommendations of the Secretary of State. Lee Payne is from Los Angeles, Calif.; Eugene Bennett from San Francisco, Calif.; and Milton C. James is Assistant Director of the U. S. Fish and Wildlife Service, Washington, D. C.

Jose Cardona-Cooper, the first chairman, was a fishery trainee under the program of the Interdepartmental Committee for Scientific and Cultural Cooperation, from January 1948 to March 1949. The Service administered his training at Stanford University.

1/SEE COMMERCIAL FISHERIES REVIEW, MARCH 1950, P. 66; NOVEMBER 1949, PP. 71-2; JUNE 1949, PP. 59-62.

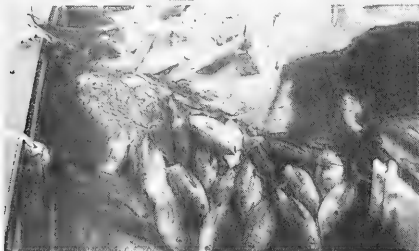
were apparently scattered in small schools, only a-dozen or so being taken at any one time, and no large concentrations were found. First schooling of albacore was noted during the second week in July, when a series of fishing efforts from Cape Blanco northward to the Columbia River resulted in a progressive increase in the daily catch. During this time the albacore were observed in small schools 80 to 100 miles offshore.

During July and the first part of August, exploratory fishing and gear testing was carried out off the Washington, Oregon, and British Columbia coasts. Three weeks were spent in Alaskan waters as far north as the vicinity of Cape St. Elias and up to 300 miles offshore. Water temperatures were generally cold, and only a few scattered tuna were caught north of Dixon Entrance. The vessel left Alaskan waters on September 6, and again fished southward past the Queen Charlotte Islands, where albacore were still being taken on September 9. Explorations off the Washington and Oregon coasts during the last 2 weeks of September resulted in negative findings.

Standard commercial surface-trolling gear was used as the primary means of locating and taking albacore. Linen and nylon gill nets and long line were experimented with. Only one albacore was taken on the long line. Considerable success was attained with the gill nets, and catches up to 160 tuna were made; the nets also proved valuable in catching tuna when none were showing or biting, and served also as a medium of determining vertical distribution of the fish.

Oceanographic and biological observations were made, including 100 water samples, over 150 bathythermographic casts, and numerous plankton tows. Lengths and weights were recorded of all fish caught, and a number of stomach samples taken. More than 400 albacore were tagged with plastic disc tags, with no returns reported to date. Daily radio broadcasts of fishing results were made to the commercial fleet.

On August 1, while investigating a report of large schools of tuna off the Columbia River, the John N. Cobb discovered a previously uncharted seamount with depths as shallow as 20 fathoms at a position of 46°44' N. latitude, 130°47' W. longitude, approximately 270 miles west of Willapa Bay, Washington. Good catches of large red snapper, averaging 15 pounds each, were made with long-line gear in 70 fathoms of water. While passing over the seamount again on September 15 and 16, 7 sets of long-line gear were again made at depths from 40 to 110 fathoms, and 2 species of rockfish and 4 halibut (weighing up to 43 pounds) were taken. Recording fathometer traces indicate the bottom to be quite rough and hard, and it is questionable if these grounds can be successfully trawled.



A GILL-NET CATCH MADE OFF THE WASHINGTON COAST BY THE JOHN N. COBB. ALBACORE TUNA IN FOREGROUND, AND SHARKS IN BACKGROUND.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, OCTOBER 1950, PP. 32-3; AUGUST 1950, P. 18; JULY 1950, PP. 25-6; JUNE 1950, P. 21.

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"JOHN N. COBB" TO EXPLORE SHRIMP AND CRAB FISHING IN SOUTHEASTERN ALASKA: In order to explore shrimp and crab fishing grounds in the inside waters of Southeastern Alaska, the John N. Cobb, one of the Service's exploratory fishing vessels, plans to leave Seattle on October 30 for a six weeks cruise. Main emphasis will be in the areas which show promise of supporting commercial quantities of shrimp and crab.

Exploration will be carried out in the region of the west coast of Baranof and Chichagof Islands, both in the protected bays and inlets and on the offshore banks. Chatham Strait and the inlets off Chatham Strait will be explored. If time allows, some work will be done off the west coast of Prince of Wales Island.

Several types of gear will be used, including beam trawls and shrimp and crab pots. Otter trawls will also be employed as a means of sampling the bottom life. Recording fathometer traces will reveal data on the trawlability of the bottom, and oceanographic and other scientific observations will be made at each fishing station. The Fishery Products Laboratory at Ketchikan will carry out experiments in freezing shrimp aboard the vessel.



Pacific Marine Fisheries Commission Meets

The presentation and discussion of research on certain West Coast fisheries was the main purpose of the meeting of the Pacific Marine Fisheries Commission held at Bellingham, Washington, on July 24-25, 1950. The following is a summary of some of the major presentations and discussions:

TUNA: Market samples of albacore were reviewed by the various research agencies. These indicated to date a run of fish in the Northwest catches somewhat larger than those of 1949. Attempts reported by the biologists of the Fisheries Research Board of Canada to determine the age of albacore by counting the number of rings present on the vertebrae revealed that the numbers found in local albacore did not coincide with the numbers found in Japanese albacore of similar lengths.

Reports on the scouting for and tagging of albacore being conducted by the U. S. Fish and Wildlife Service and the Canadian investigators were of much interest. A proposal to extend the 9-pound minimum size limit for albacore, as exists in California, to the rest of the Coast was discussed but no action taken.

TROLL SALMON: Studies on ocean migrations of chinook and silver salmon, as determined by offshore tagging experiments conducted under the coordination of the Pacific Marine Fisheries Commission for several years, have revealed that the chinook salmon make extensive coastwise migrations while those of silver salmon are somewhat more local in nature. In order to further study the ocean migrations of silver and chinook salmon and to corroborate the findings of the tagging program, about 1-1/2 million salmon fingerlings of the 1949 brood year have been marked in California, Oregon, and Washington. The troll catches will be sampled for these fish when they appear in the fisheries. Additional fingerlings will be marked during this fall and next spring in conjunction with this program.

SHARK: It was reported that the imports of liver oils, development of synthetics, and low abundance of sharks have resulted in a discontinuation of the Pacific Coast shark fishery.

OTTER TRAWL: Research reported on the otter trawl fishery included studies on market sampling of the catches, tagging, and the use of bottom fish as mink food. A closed winter season for the trawl fishery was discussed and the subject deferred for additional study.

SABLEFISH: In Washington, Oregon, and California, a total of 1,100 sablefish (black cod) have been tagged and further tagging is planned as part of this program.

Racial analyses based on meristic counts are being undertaken on sablefish along the coast from California to Alaska.



Pacific Oceanic Fishery Investigations

EXPERIMENTAL FISHING TRIP COMPLETED BY "JOHN R. MANNING" (Cruise No. III):^{1/} On this cruise the John R. Manning conducted experimental fishing operations with a standard West-Coast purse-seine in waters of the Phoenix and Line Island Groups in an effort to determine the abundance and availability of tuna. This research vessel of the Service's Pacific Oceanic Fishery Investigations left Pearl Harbor on July 15 and returned October 2, 1950.

After fishing in the Phoenix Island Group from July 24 until August 28, passage was made to Christmas Island by way of Jarvis Island. The vessel left Christmas Island September 13, prospected the southern contact margin of the counter-equatorial current, and then proceeded west to Palmyra.

Arrival at Kingman Reef was made September 20 where production trolling was undertaken for comparison with similar efforts made in the area on Cruise II in April and May 1950.^{2/}

Fishing Activities--Phoenix Islands: Unfavorable weather and poor fishing conditions were encountered in the entire Phoenix Group, and the primary objective (experimental fishing) was not realized. Combination live-bait purse-seine operations planned in conjunction with the Henry O'Malley (another of the Service's research vessels) were not possible during that vessel's short stay in the Phoenix Group.

No surface tuna or other signs of fish were seen near Hull and Gardner Islands. Canton itself did have an occasional showing of fish under birds, but these were small skipjack weighing one and two pounds.

McKean, Birnie, and Phoenix Islands showed excellent surface-trolling possibilities well inshore. The three prospecting trolling lines would consistently take 25 to 80 pounds of yellowfin when the lee and fringing reefs were closely paralleled at 6.5 to 7 knots.

No attempt was made to troll these islands on a production basis, but a conservative estimate would be that a vessel fishing eight lines would take in excess of a short ton of yellowfin in a 12-hour period. As an illustration of this, sixteen yellowfin (average weight 35 pounds) were taken in one hour on McKean Island.

No fish that could possibly have been seined were encountered in the Phoenix Islands from July 24 to August 29; on the latter date the John R. Manning left Enderbury for Jarvis Island.

The natives and experienced local inhabitants state that breezing schools and other signs of surface fish are most frequently seen in April, May, and June in the Phoenix Islands.

^{1/}SEE COMMERCIAL FISHERIES REVIEW, JULY 1950, P. 28.

^{2/}SEE COMMERCIAL FISHERIES REVIEW, JULY 1950, P. 27.

The passage to Jarvis from Enderbury was diverted to include a 200-fathom bank at Lat. 2°55' N., Long. 164°25' W. As the vessel proceeded northward from Enderbury, the weather became progressively better and was excellent upon arrival on the bank. The vessel was allowed to drift freely overnight on this bank. Although feed was in abundant evidence under a night-light, no tuna or signs were seen the following day.

Fishing Activities--Line Islands: The next landfall, Jarvis, carried the vessel back into the path of the strong easterly winds and seas. Tuna here readily took the trolled jigs and tuna were seen singly and in groups of up to a dozen traveling and feeding on the south and west sides of the Island. This area to the south and west of the Island was worked carefully, but the fish neither schooled nor took a lead, and intermittent rain storms accompanied by winds of 40 m.p.h. hampered fishing activities.

Approximately six "breezing" schools of tuna were sighted off the SW tip of Christmas Island on September 9. These schools were estimated to be from 5 to 15 tons each and consisted of yellowfin of mixed sizes. A set was made on one of these schools but no fish were taken. On succeeding days three more sets were made on less promising schools of fish--500 pounds of wahoo (Ono--A. solandri) were taken on one of these sets. Sharks and wahoo were taken in lesser quantities on all sets. Tuna were seen in these schools, however, and jig lines took 40 pounds of yellowfin.

Various parts of the seining operation were timed on these sets, and a lead-line drop test was undertaken to determine the length of time required for the lead line to reach a given depth after the seine clears the table.

Palmyra was almost completely barren of signs of tuna. Large schools of feed (2" squid) were seen with great quantities of birds working. Only three tuna were taken by trolling in this vicinity in approximately three days.

Kingman Reef was trolled very intensively with 8 lines. The same areas were worked as in the case of Cruise II and additional water areas were covered. The average daily take was 150 pounds of tuna. Comparing this with the results in April and May, which exceeded 2,000 pounds a day, this trial was much less productive.

Other Activities: Stomachs, gonads, and ovaries were preserved and total length measurements taken on 50 tuna caught during the cruise; 386 bathythermograph casts were made, from which the positions and boundaries of the major currents at this season may be estimated.

Night-light collections of tuna food fish and invertebrates were taken in the lee of all islands mentioned and on two occasions in the open sea.

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"HUGH M. SMITH" TO FISH TUNA WITH LONG LINES BETWEEN HONOLULU AND THE EQUATOR (Cruise No. VII): The Service's Pacific Oceanic Fishery Investigations research vessel Hugh M. Smith left Honolulu on October 17 for an extended cruise through the Line Islands south of Hawaii.

The primary object of the cruise is to determine the abundance of yellowfin tuna in regard to the ocean current systems of the tropical and subtropical Pacific

Ocean south of the Hawaiian Islands. Fishing will be conducted with tuna long-line gear at 60-mile intervals from the southern portion of the north equatorial current, across the equatorial countercurrent and into the south equatorial current. This operation is designed to test the theory that since the occurrence of basic food organisms appears to be closely connected with this system of currents, the tunas may also occur in a predictable pattern on a similar basis.

As secondary projects, the vessel will engage in a number of subsidiary operations. Observations will be made upon the depth of occurrence of tunas to determine to what degree the decreasing temperature which is found below the surface affects the vertical distribution of tunas. Further, by fishing systematically from the islands for some distance seaward it is hoped that information can be secured concerning the degree to which tunas are associated with land masses.



President Appoints Deputy U. S. Commissioner on the International Whaling Commission

President Truman on October 7 appointed Dr. Hilary J. Deason, Chief of the Office of Foreign Activities, U. S. Fish and Wildlife Service, as Deputy United States Commissioner on the International Whaling Commission. Dr. Remington Kellogg, Director of the United States National Museum, is the United States Commissioner, having been appointed by the President on April 11, 1950.



HILARY J. DEASON

The International Whaling Commission, with headquarters in London, is composed of representatives appointed by the sixteen countries who have adhered to the International Agreement for the Regulation of Whaling signed at Washington, December 2, 1946. The Commission is an international regulatory body charged with the responsibility for conserving and maintaining the whale populations of the world.

Deason was a member of the United States delegation at international whaling conferences held at London in 1945 and Washington in 1946. He was a technical advisor at the first two meetings of the Commission, London 1949, and Oslo 1950. As part of his duties in the Fish and Wildlife Service, he handles the licensing of United States whaling enterprises, coordinates enforcement of international regulations, and supervises the biological and statistical activities of the Service with respect to whaling.



Prices Up On Fur-Sealskins

Sealskin prices increased substantially at the fall auction of Government-owned fur-sealskins, the Fish and Wildlife Service reported in October.

The auction, held October 9 by the Fouke Fur Company in St. Louis, included 25,697 fur-sealskins from the Government-administered Fribilof Islands in Bering Sea, 2,000 Canadian-owned Fribilof Islands skins, 2,159 Cape of Good Hope fur-sealskins for the Union of South Africa, and about 3,000 Cape of Good Hope, New Zealand, and North American sealskins for private shippers. Included in the sale were 279 blue fox pelts from the Fribilof Islands.

Fur buyers paid an average of \$95.52 for all United States Government sealskins, an increase of 52 percent over the average price paid at the previous sale on April 17, 1950. The Government-owned fur-sealskins and fox pelts sold for a total of \$2,456,928.35.

Black sealskins sold for an average of \$106.10, an advance of nearly 84 percent over the spring average. Dyed "Matara" (brown) skins sold for an average of \$98.25, an increase of 48 percent. Average price of "Safari" (lighter-brown skins) was \$74.60--which was 51 percent over the spring sale.

Canadian-owned skins, part of the treaty-provided allotment to Canada from the Pribilof Islands' fur-seal take, sold for substantially the same as the United States-owned skins. Cape of Good Hope sealskins averaged \$34.57--an advance of nearly 58 percent. Blue fox pelts sold for an average \$8.65. This was an increase of 99 percent over last October's sale price.

One factor that apparently entered into the advance in prices was the large attendance of fur buyers, with spirited bidding--which was reported to represent greater-than-average competition for the skins.



Reduction of Anchovies in California Not Approved by State

The California Fish and Game Commission has turned down a request of the San Francisco Sardine Association to permit the reduction of anchovies into commercial oils and meals, according to the September 27 issue of Outdoor California issued by the Commission. "The abundance of anchovies on the fishing grounds has not yet proved large enough to warrant a reduction fishery. Large scale fishing or reduction might be disastrous without sufficient investigation," the Chief of the Bureau of Marine Fisheries told commissioners at their September meeting.



South Pacific Fishery Investigations

NO SARDINES OBSERVED BY "BLACK DOUGLAS" ON SEPTEMBER CRUISE: On its September cruise, no sardines were observed in the area opposite and north of San Francisco by the Black Douglas, the Service's South Pacific Fishery Investigations vessel which is working on the cooperative Pacific sardine research program with the Scripps Institution of Oceanography, the California Division of Fish and Game, and the California Academy of Science. From September 5 to September 22, between Cape Blanco, Oregon, and San Francisco, California, the vessel took observations at 46 stations to determine the amount and the location of sardine spawning as well as the current pattern and temperature pattern of the area, and the types and abundance of phytoplankton present. The small plankton volumes were comparable to those of the August cruise.

While on this cruise, the vessel caught 25 albacore tuna with feather jigs and 1 dolphin (Coryphaena); and collected morphometric data and stomach contents for later analysis.

A special study cruise was begun on October 7 by the Black Douglas for the purpose of collecting data on the mechanisms of internal waves. The vessel will work with the MV Crest and MV E. W. Scripps of the Scripps Institution of Oceanography.

Whale and Sperm Oil Prices Expected to be Higher in 1950-51

Whale and sperm oil prices in 1950-51 almost certainly will be higher than in 1949-50, according to the Assistant Agricultural Attache of the American Embassy at London. This is primarily because world prices on fats and oils in general have risen sharply since the beginning of the Korean conflict and that recent quotations on whale and sperm oils, particularly the former, have been higher than they were several months ago.

Supplies of whale oil on the market in recent months have consisted entirely of summer production--for example, from whales caught off the West and East African coasts, Iceland, and the Faroe Islands.

Prices for whale oil, exaggerated somewhat by the seasonal scarcity, recently have gone to as high as £110.11s. (\$309.54) per long ton for small lots purchased from Canada and Iceland. Earlier, a company operating off Madagascar sold whale oil, comparable to the Antarctic product, at close to £100 (\$280) per ton. The bulk of the whale oil from the 1949-50 Antarctic whale catch was sold at about £80 (\$224) per ton.

Sperm oil, which only a few months ago was in surplus supply, has been in strong demand since the fighting in Korea started. All available supplies have been sold at from £55 to £60 (\$154 to \$168) per ton. This is not substantially different from the price of £57.10s (\$161) prevailing in May of this year.

Negotiations on prices to be paid for their 1951 output recently have been carried on between British whale oil producers and the British Ministry of Food. For 1949-50 production, the agreed price was £80 (\$224) a ton. Although this price was lower than the £90 (\$252) agreed in the previous season, it was higher than had been expected prior to Britain's devaluation of the pound sterling in September 1949.



Wholesale and Retail Prices

WHOLESALE PRICES, SEPTEMBER 1950: Wholesale prices for edible fishery products continued to rise during September, with the largest increases occurring in the fresh and frozen unprocessed (drawn, dressed, or whole) finfish and canned fishery products (see table 1 on the following page).

The September index for the drawn, dressed, or whole finfish subgroup was 13.6 percent higher than for the previous month, and 22.6 percent higher than September 1949. This September all fresh-water fish prices in this subgroup increased substantially as compared with the previous month because of the Hebraic holidays which occurred during the month, resulting in an increased demand for these products. However, lake trout prices were only slightly higher. Haddock, halibut, and salmon prices in September also were considerably higher than in August. Stormy weather during September in several of the nation's fishing centers accounted for the increase in prices paid for salt-water fish. Prices of all individual items in the subgroup were higher than in September 1949, except for lake trout which sold at lower prices.

In spite of the increase in drawn, dressed, or whole finfish, fresh processed fish and shellfish prices were only 0.8 percent higher during September as compared with August and 6.3 percent higher than in September 1949. Among the individual items in this subgroup, haddock fillets and shucked oysters sold at higher prices during September, while fresh shrimp prices dropped. Heavy production during the month accounted for the decline in shrimp prices.

Table 1 - Wholesale Average Prices and Indexes of Fish and Shellfish, September 1950, with Comparative Data								
GROUP, SUBGROUP, AND ITEM SPECIFICATION	POINT OF PRICING	UNIT	AVERAGE PRICES (\$)			INDEXES (1947 = 100)		
			Sept. 1950	Aug. 1950	Sept. 1949	Sept. 1950	Aug. 1950	Sept. 1949
ALL FISH AND SHELLFISH (Fresh, Frozen, and Canned)			112.5	112.5	112.5	105.6	105.6	98.9
Fresh and Frozen Fishery Products			113.3	112.2	113.7	105.2	105.4	99.2
Drawn, Dressed, or Whole Finfish:								
Haddock, large, offshore, drawn, fresh	Boston	lb.	.15	.11	.09	150.7	112.0	97.2
Halibut, Western, 20/80 lbs., dressed, fresh or frozen	New York City	"	.40	.38	.34	115.3	110.0	98.5
Salmon, king, lge. & med., dressed, fresh or frozen	" " "	"	.56	.49	.49	138.0	119.4	119.2
Lake trout, domestic, mostly No. 1, drawn (dressed), fresh	Chicago	"	.47	.47	.51	103.8	103.5	111.5
Whitefish, mostly Lake Superior, drawn (dressed), fresh	"	"	.51	.39	.47	147.1	112.0	135.8
Whitefish, mostly Lake Erie pound net, round, fresh	New York City	"	.79	.49	.52	179.4	110.8	117.3
Yellow pike, mostly Michigan Lakes Michigan & Huron, round, fresh	" " "	"	.58	.56	.44	135.5	130.2	103.6
Processed, Fresh (Fish and Shellfish):						95.0	94.2	89.4
Fillets, haddock, small, skins on, 20-lb. tins	Boston	lb.	.27	.25	.28	97.7	90.9	100.2
Shrimp, lge. (25-30 count), headless, fresh or frozen	New York City	"	.59	.64	.55	85.3	92.9	78.8
Oysters, shucked, standards	Norfolk area	gal.	4.50	3.95	4.25	110.8	97.2	104.6
Processed, Frozen (Fish and Shellfish):						103.5	102.9	94.8
Fillets: Flounder (yellowtail), skinless, 10-lb. boxes	Boston	lb.	.35	.35	.31	113.0	111.4	98.5
Haddock, small, 10-lb. cello-pack	"	"	.25	.25	.22	115.4	113.7	98.4
Rosefish, 10-lb. cello-pack	Gloucester	"	.24	.22	.20	122.2	112.2	97.5
Shrimp, lge. (25-30 count), 5- to 10-lb. boxes	Chicago	"	.61	.64	.65	88.2	92.0	91.5
Canned Fishery Products						111.3	108.3	100.0
Salmon, pink, No. 1 tall (15 oz.), 48 cans per case	Seattle	case	22.90	20.88	16.99	149.3	136.1	110.8
Tuna, light meat, solid pack, No. 8 (7 oz.), 48 cans per case	Los Angeles	"	14.81	14.94	15.25	96.4	97.2	99.2
Sardines (pilchard), California, tomato pack, No. 1 oval (15 oz.), 48 cans per case	"	"	6.25	6.13	5.63	69.9	68.5	74.1
Sardines, Maine, keyless oil, No. 4 drawn (3 1/2 oz.), 100 cans per case	New York City	"	5.75	6.13	8.63	56.4	60.1	84.6

September prices for the frozen processed fish and shellfish subgroup were only 0.6 percent higher than in August and 9.2 percent higher than in September a year earlier. Prices of fillets advanced in September and were higher than a year ago, but frozen shrimp prices dropped and were substantially below September 1949 because of heavy cold storage holdings.

Except for canned salmon, September prices of other items in the canned fishery products subgroup showed signs of weakening. September quotations were substantially higher for canned pink salmon and only slightly higher for California sardines. These increases accounted for the rise in the canned fishery products index from 136.1 percent in August to 149.3 percent of the 1947 average in September. Prices paid for canned Maine sardines and tuna in September were slightly below those paid in August and prices of canned tuna, California sardines, and Maine sardines were below those quoted in September 1949. On the other hand, canned salmon prices were considerably higher this September. The September index for this subgroup was 11.3 percent above that for the corresponding month in 1949.

RETAIL PRICES, SEPTEMBER 1950: Between August 15 and September 15 this year, retail food prices declined 0.2 percent on the average, but on September 15, 1950, prices were still 2.1 percent higher than on the same date a year earlier (table 2). The retail food price index on September 15 was 208.5 percent of the 1935-39 average.

Table 2 - Retail Price Indexes for Foods and Fishery Products,
September 15, 1950, with Comparative Data

Item	Base	I n d e x e s		
		Sept. 15, 1950	Aug. 15, 1950	Sept. 15, 1949
All foods	1935-39 = 100	208.5	209.0	204.2
All fish and shellfish (fresh, frozen, & canned) ..	do	311.4	302.5	311.9
Fresh and frozen fish	1938-39 = 100	283.4	279.4	260.1
Canned salmon: pink	do	359.8	337.5	428.8

On the other hand, fish and shellfish (fresh, frozen, and canned) retail prices followed the general wholesale trends for these products and increased 2.9 percent from August 15 to September 15, but on the latter date the prices were 0.2 percent below September 15, 1949.

Prices of only fresh and frozen fishery products at retail rose 1.4 percent from August 15 to September 15, and on the latter date were 9.0 percent higher than in mid-September 1949. This index was 283.4 percent of the 1938-39 average in mid-September this year.

The biggest increase in retail prices of fishery products occurred in canned pink salmon. Prices for this product rose 6.6 percent from mid-August to mid-September, but on the latter date prices were still 16.1 percent below those which prevailed in mid-September 1949. This increase in canned salmon is attributed to the small pack in Alaska this year--on October 14 the total pack was 3,235,828 cases, compared with 4,375,147 cases in the 1949 season, and 3,974,540 cases in the 1948 season. The Alaska salmon pack season ended October 14.



National Fisheries Trends and Outlook--October-December 1950

Markets for fishery products during the final quarter of 1950 will be generally favorable, according to a report issued in October by the Bureau of Agricultural Economics, Department of Agriculture, and prepared in cooperation with the Fish and Wildlife Service. Demand for fishery products is expected to share in the heightened demand for foods generally. However, the expected plentiful supplies of food and of fishery products will exercise a moderating effect on price increases.

PRODUCTION: Although fisheries production is expected to decline seasonally as the winter months approach, the total commercial catch in the United States and Alaska will be close to the average for the fourth quarter.

FROZEN FISH: Freezings of fish will also decline seasonally during the fourth quarter this year and the first part of 1951. Total stocks of frozen fishery products in the United States and Alaska on October 1 were 158,473,039 pounds--5.2 percent larger than a year earlier. Cold storage stocks probably will be expanded still further as the fall season continues in order to build up supplies of frozen fish for distribution during the low-production period in the winter months.

CANNED FISHERY PRODUCTS: The output of canned salmon in 1950 was much lower than last year and the lowest since 1921. Canned tuna and Maine sardine produc-

tion are running ahead of output during the same months in 1949 and are likely to establish record-high levels for the year. In addition, California sardine producers have gotten off to a good start in the production season that started in August.

IMPORTS AND EXPORTS OF FISHERY PRODUCTS: Imports of fishery products this fall, especially of frozen groundfish and rosefish fillets, are expected to be larger than in the same period of 1949. Exports of fishery products during the remainder of 1950 probably will not be as large as the previous year.

CONSUMPTION AND PRICES: Civilian consumption of fishery products in the United States during the remainder of the year is expected to be much the same as in the comparable months of 1949. Although supplies of some canned fishery products available to civilians probably will be lower than in the previous year, consumption of all canned fish in the next few months may be about as large as last fall and early winter. Consumption of fresh and frozen fishery products will run at about the same rate as in late 1949. With strong consumer demand for food in prospect, retail prices of fresh and frozen products during the remainder of 1950 are expected to continue at a higher level than a year earlier. Although prices of canned salmon are expected to be much higher than those prevailing earlier during 1950, canned fish as a whole may average only slightly higher than in the fall months of 1949.

OUTLOOK FOR 1951: Supplies of fishery products in 1951 are not expected to be much different in total than in 1950. More fresh and frozen fish probably will be available, but there will be somewhat smaller supplies of canned fish, particularly of canned salmon through mid-1951. Military purchases of fishery products, especially of canned fish, are expected to be much larger than procurement from the output of a year earlier. In view of the prospective strong consumer demand for food, especially for meat and other protein foods, retail prices, of fresh, frozen, and canned fishery products probably will average somewhat higher for 1951 than for the preceding year. For certain canned fish, in short supply (especially salmon) retail prices will average much higher.

Imports of fishery products in 1951, especially the frozen commodities, are expected to continue at a high level and may even be slightly larger than a year earlier. Exports of these products may not be much different from the levels of the past two or three years, at least until the latter part of 1951.



Economic Cooperation Administration Program Notes

AID TO KOREA: Experts from the Economic Cooperation Administration's mission to Korea have made an inspection trip to the Korean Island of Cheju Do and are working with government officials on plans for strengthening the Island's economy, the Acting Director of ECA's Korea Division announced on October 3.

The Island's chief industry--fishing--needs to be strengthened. New fishing boats are needed as well as facilities for processing and distributing fish. During the present Korean hostilities, the Island's fishing industry has suffered because of the prohibition on night fishing and restrictions on day fishing imposed by the United Nations command.

President Truman has told the Economic Cooperation Administration to concentrate its aid program for the Republic of Korea on recovery measures aimed at "developing and maximizing economic self-help," according to an October 9 news release from that agency.

Under the President's directive, ECA will be responsible for furnishing, among others, the following types of assistance:

"The provision of equipment, supplies, and advisory aid required to maximize the output of Korean agricultural and fisheries resources, and of essential civilian industrial production facilities which are not directly utilized by the United Nations Command for predominantly military purposes."

EUROPEAN POPULATION BOOMING: ECA officials pointed out in an October 29 news release that the European countries participating in the Marshall Plan already have boosted grain and other food production facilities above 1938 levels--but not enough to compensate for the 10 percent increase in population. By 1952, agricultural production may be 15 percent above prewar in these nations as compared with the expected 12 percent boost in population. Consequently, if food imports are maintained, 1952 per capita food supplies will equal the 1938 rate.

According to most recent estimates, the European nations participating in the Marshall Plan will have a population of 280,000,000 by the end of 1952, or about 12 percent above prewar.

ECONOMY OF EUROPEAN MARSHALL PLAN COUNTRIES STRONGER: The Marshall Plan countries of Europe are in a stronger position economically to meet the new problems brought about by the Korean conflict. The summer of 1950 saw a continuing climb in Western Europe's hard currency reserves, a sharp fall in unemployment in all countries, an expansion of construction, a further narrowing of the dollar gap, and a continuing increase of exports. This latest summary of Western Europe's economic position is contained in the October issue of ECA's bi-monthly publication Recovery Guides.



VALUE OF U. S. IMPORTS EXCEEDED EXPORTS IN JULY-AUGUST 1950: For the first time in 13 years, the value of United States imports exceeded that of exports in July and August 1950, according to an October 29 ECA news release. Excluding U. S. shipments under the Mutual Defense Assistance Program, the U. S. imported \$32 million per month more than she exported during July and August. During the same two months in 1949, U. S. exports exceeded imports by \$420 million per month. The result has been a sharp increase in the U. S. trade deficit with Latin America and the non-Marshall Plan sterling areas. Payment of U. S. dollars in settlement of these deficits has, in turn, contributed to the large increase in Western Europe's hard currency reserves.

INDONESIA AND THE UNITED STATES SIGN ECONOMIC COOPERATION AGREEMENT: An agreement providing for economic cooperation between the Republic of Indonesia and the United States was signed on October 16. It will take effect upon approval of the Parliament of the Republic of Indonesia for ratification. The agreement arises from recommendations made by the Economic Survey Mission that visited Indonesia in April this year. Indonesia is the third Asian state to enter into an economic cooperation agreement with the United States--the Union of Burma on September 13 and Thailand on September 19, 1950, signed similar agreements.

As a result of discussions with Indonesian officials at the time of the Mission's visit to Indonesia, it was decided that assistance could advantageously be made available in the form of supplies and technical advice in fields of public health, agriculture, fisheries, industry, and education. The United States Government will furnish such assistance in these fields as may be desired by the Indonesian Government.

Included in an initial request for urgently needed supplies prepared by the Indonesian Government are motorized fishing vessels. These supplies will be obtained not only in the United States, but in such countries where they may be readily available.

TECHNICAL ASSISTANCE PROJECT FOR PORTUGAL APPROVED BY ECA: A technical assistance project covering a visit to the United States of two Portuguese technicians to study American fisheries research methods was approved by ECA, and a number of other projects of this nature are under consideration, the American Embassy at Lisbon reported in a dispatch dated August 14.

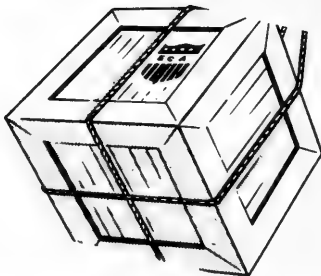


ECA Procurement Authorizations for Fishery Products

Among the procurement and reimbursement authorizations by the Economic Co-operation Administration during October 1950 was \$1,095,000 for the purchase of canned fish, and fish and whale oils from the United States and Possessions (see table).

ECA Procurement Authorizations for Fishery Products, October 1950			
Product	Country of Origin	Recipient Country ¹	Amount Authorized
Canned fish ²	U. S. & Possessions	Greece	\$ 175,000
Whale and fish oils	" " "	German Federal Republic	900,000
Whale and fish oils	" " "	France	20,000
Total			\$1,095,000
¹ /The recipient country is the procuring agency, and the government of the participating country or its authorized agents or importers do the purchasing.			
² /Except canned shrimp, crab and lobster meat, salmon, or tuna.			

Total ECA procurement authorizations for fishery products from April 1, 1948, through October 31, 1950, amounted to \$29,111,000 (\$16,442,000 for edible fishery products, \$11,129,000 for fish and whales oils, and \$1,540,000 for fish meal). Of this amount, \$10,022,000 was used by the recipient countries for purchases in the United States (\$6,954,000 for canned fish; \$9,000, salted fish; and \$3,059,000, fish and whale oils).





Angola (Portuguese West Africa)

PRODUCTION OF FISHERY PRODUCTS, 1949:^{1/} Catch: Angola's 1949 fisheries production of 130,617 metric tons, valued at 91,178,452 angolares (\$3,665,373) exceeded the 1948 production of 113,057 tons, valued at 82,225,281 angolares (\$3,190,341). Quality during the year improved, partly because of concentration on certain species by producers who were long established, and partly as the result of migration of skilled fishermen from Portugal, who thus enlarged the Angolan fleet of purse-seine vessels used for catching tuna and similar fish, a September 5 American consular dispatch from Luanda states.

Angolan Exports of Fishery Products by Commodity, 1948-49 (Quantity and Value)						
Product	1 9 4 9			1 9 4 8		
	Quantity	Value		Quantity	Value	
	Metric Tons	Angolares	U.S.\$	Metric Tons	Angolares	U.S.\$
Fish:						
Fresh, frozen, and salted ..	97	425,000	16,490	157	723,980	28,090
Canned	2,318	42,565,000	1,651,522	1,738	22,235,949	862,755
Dried	15,105	74,041,000	2,872,791	13,831	55,939,190	2,170,441
Fish meal	13,381	41,358,000	1,604,690	14,201	28,392,114	1,101,614
Guano	1	2,000	78	240	479,360	18,599
Fish oil	710	2,963,000	114,964	1,056	1/	1/
Total	31,612	161,354,000	6,260,535	31,223	107,770,593	4,181,499
1/Not available.						

Canned Fish: Production of canned fish (principally tuna and sardines) increased considerably and its value almost doubled. A substantial portion of the canned tuna went to the United States, though the potentialities of this market could not be and will not be fully exploited until local canners and government-control bodies can import sufficient olive oil to concentrate on an olive-oil pack in place of the peanut-oil pack which now comprises the larger proportion of the annual production. The latter type of product, however, apparently found a ready foreign market, particularly in Italy, it is reported.

Byproducts: Production of fish meal was slightly less than that of the previous year. While some efforts were made to install mechanical equipment for the rendering of the catches, most of the small plants in the south of the Colony, where this industry is centered, depended upon hand labor entirely or upon relatively outmoded equipment. The continuing heavy demand for the product was reflected in the remarkable increase in value of exports. Demand from various foreign markets was reported by the industry to be in excess of supply.

1/SEE COMMERCIAL FISHERIES REVIEW, AUGUST 1950, PP. 30-9.

Demand for guano, which has been moderate in 1948, dropped to a negligible total; that for fish oil was reduced to such an extent that many rendering plants were using the oil as a fuel.

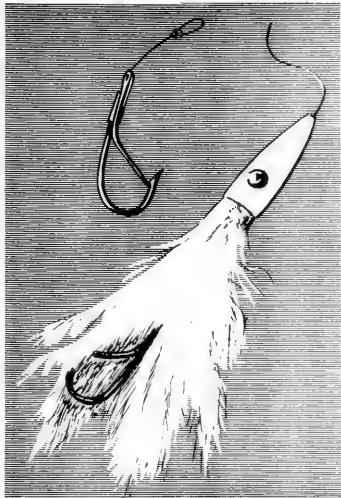
Exports: Exports of fresh, frozen, and salted fish dropped considerably in 1949 (table 1). Shipments to the United States consisted of 3,789 tons of fish meal, valued at 12,001,000 angolaes (\$465,639); and 240 tons of canned tuna, valued at 4,875,000 angolaes (\$189,150).

Consumption: Domestic consumption of processed fish is not heavy, except in the case of dried fish. The 1949 production of dried fish amounted to about 20,000 tons, of which one-fourth was consumed as an element of the native staple and the balance exported to the Belgian Congo.



Canada

LOCKED HOOK USED TO TAG ALBACORE: A novel method of tagging fish is being used off the coast of British Columbia, according to the August 1950 Trade News of the Canadian Fisheries Department. The tuna are being tagged without being taken out of the water. This is accomplished by means of a hook with a special locking device (see illustration) both bare and seated in a lure.



A thin strip of metal, carrying a number and a message, is wrapped around the shank of the hook, which is made fast to the lure and main line by a short section of nylon leader, which has a breaking strain of 30 pounds. A good hard jerk by the albacore fastens the hook to the fish. The hooks, of a patent design, were made to order from Z-nickel wire.

A member of the Pacific Biological Station at Nanaimo, B. C., has been studying albacore this summer aboard a commercial vessel, the Black Dog. He made one trip in July off the United States west coast for general observations on water temperatures, food, commercial fishing methods, etc., and is continuing his work on subsequent trips. Emphasis is being placed on tagging, which can now be carried out without bringing the fish aboard.



Denmark

NEW TYPE OF TUNA NET: A new type of tuna net was constructed this summer by a fishing vessel captain in Esbjerg, Denmark. If it meets expectations, it will be a much cheaper type of gear for tuna fishing than the purse seine, according to a recent issue of *Svenska Vastkustfiskaren*, a fishery periodical. It is claimed that the net can be made for about \$580, while a purse seine of the type used in Norway presently costs about \$5,800. The Danish research vessel Jens Vaevers will test the invention.



Formosa (Taiwan)

DECLINE IN FISH CATCH EXPECTED FOR 1950: Since the Nationalists' evacuation from Hainan Island and Chusan Islands, the coastal fishing areas that supply fish to Taiwan (Formosa) have been seriously curtailed. The fish catch this year (1950), therefore, is expected to decrease by 30-40 percent in comparison with that of last year.

Local fishermen are planning to start deep-sea fishing in the Pacific Ocean off the Philippines and the South Seas, reports a September 9 American Embassy dispatch from Taipei. It is reported that some Chinese fishermen have already started fishing in these areas.

* * * * *

NUMBER OF FISHING BOATS AND FISHERMEN: A total of 2,452 boats (table 1) are engaged in fishing on Formosa (Taiwan). Out of a total of 152,906 fishermen, 78,791 are full-time fishermen, and 74,115 are part-time fishermen (table 2), a September 29 American consular dispatch from Taipei reports.

Table 1 - Number of Fishing Boats Operating in Taiwan's Fisheries	
Type of Fishing Boat	Number
Motorboat (over 20 tons)	236
Motorboat (under 20 tons)	790
Total motorboats	1,026
Small wooden boats without motor ...	777
Bamboo fish rafts	649
Total boats without motor	1,426
Grand total	2,452

Table 2 - Number of Fishermen Engaged in Taiwan's Fisheries	
Type	Number
Full-time fishermen:	
Proprietors	38,000
Employees'	40,791
Total	78,791
Part-time fishermen:	
Proprietors	39,918
Employees	34,197
Total	74,115
Grand total	152,906



France

FISH IMPORTS RESTRICTED: Imports of fish into France are to be restricted again, the British fishery periodical *The Fishing News* of August 26 reports. The French Minister of the Merchant Marine has announced that several concessions granted to other countries under agreements sponsored by the Office of European Economic Co-operation are to be withdrawn immediately because of the serious effect they were having on certain sections of the French industry.

The imports affected by the new restrictions are dried, salted, and smoked fish from Great Britain and Sweden; fresh and frozen fish from Iceland and Sweden; canned and other preserved fish from Great Britain, Iceland, and Sweden.

Imports of crabs and lobsters are to remain free, and it is likely that mussels and other shellfish will be added to the unrestricted list.

These restrictions were imposed to meet the protests made by French fishermen against imports of fishery products.



German Federal Republic

FISHERY FACTORY SHIP PLANNED BY GERMAN FIRM: A Bremerhaven company, which operated the factory ship Wezer in the Baltic during World War II, has revived plans for a factory ship equipped to catch, fillet, and freeze fish. Ships of this type built in the United States are to be inspected, as it is believed that Marshall Plan funds might be made available for the purchase of a ship from the United States, according to a September 18 American consular dispatch from Bremerhaven.



Gold Coast

ACTIVITIES OF THE FISHERIES DEPARTMENT:^{1/} The Gold Coast Fisheries Department, operated by the Government to catch fish for canning on an experimental basis, is now also concerning itself with the canning of products other than fish. Its pilot plant, situated in the Accra suburbs, is preparing the way for the establishment of a canning factory and is presently determining what quantities and qualities of fish, fruits, or other foods are available in the Gold Coast for canning, and what markets exist for these products, an American consular dispatch dated September 15 from Accra reports.

The Fisheries Department has just purchased a second fishing boat in England. Its first boat has been fishing out of Accra for almost two years. The new fishing craft is 31 feet long and is driven by a 15 h.p. kerosene engine. The boat is believed to be ideal for the difficult weather and surf conditions it will meet in local waters. When the present herring fishing season closes, it is planned to take the boat for experimental fishing in the estuary of the Volta river at Ada. Later, the fishing grounds of the Western Province will be explored. These are the only two motorized fishing boats in use in the Gold Coast, although an estimated 50,000 people along the coast depend on fishing for their existence.

Another new activity of the Fisheries Department is the stocking with fish of newly-constructed reservoirs in the Northern Territories. The Department is presently ascertaining what fish from nearby rivers and streams can be successfully introduced into these reservoirs. In one reservoir, the young fish placed there early this year quickly established themselves and are doing well. The diets of the people in the Northern Territories contain very little proteins and it is hoped that this fish-stocking experiment will prove successful.

^{1/}ALSO P. 72 OF THIS ISSUE.

Iceland

POOR CATCHES REPORTED IN 1950 ICELANDIC HERRING FISHING SEASON BY ALL NATIONS, EXCEPT RUSSIA: Catches of all nations participating in the fishing on the Icelandic herring banks during the 1950 season (which closed in September) were poor, with the exception of Russia, according to a September 21 American consular dispatch from Bergen, Norway. The report is based on an interview with Captain Araldsen of the Norwegian fishing patrol vessel Andenes published in the September 19 issue of the Bergen newspaper Morgenavisen.

A translation of the pertinent parts of that interview follow:

"The Captain states that weather conditions during the whole season have been unusually bad. The number of days in which vessels were forced to stay at shore due to strong winds was also considerably more than normal. There were, indeed, no trawlers on the banks from August 16-29.

"Of the six nations participating in herring fishing off Iceland, Iceland had between 200 and 250 vessels; Norway approximately 190, of which approximately 42 were trawlers. About 10 Finnish vessels participated, all larger than the Norwegian vessels. Russia had from 50 to 60 vessels with four depot-ships participating--one of the depot-ships was 10,000 metric tons and the other three approximately 3,000 tons each. Approximately 50 drift-fishers from Sweden also took part.

"Average catches this year were poor. It is estimated that Iceland had a total catch of approximately 65,000 barrels of salted fish and approximately 300,000 barrels for herring meal production. The Norwegian total catch was approximately 85,000 barrels; from 15,000 to 20,000 barrels for Sweden; and the Finnish catch was about 15,000 barrels.

"It is not easy to report the quantity of the Russian catch. The Russians give no information, but there are signs which indicate that the Russians' total catch was the greatest of all. The methods used by the Russians might be worth further study.

"The first vessel the Andenes met on the fishing banks was Russian and occasional later meetings with the Russians gave an idea of the tactics they used.

"One vessel alone (or two vessels working together) is assigned a certain part of the fishing grounds. These "herring hunting vessels" cover practically the whole fishing area. It is not known whether these vessels carry special equipment or not. Most of the Russian fishing vessels were concentrated in the area where the herring was most numerous. The Russian vessels usually operated from 50 to 100 nautical miles north of Iceland, especially north of Gremsey. During July and August, the depot-ships were anchored on the fishing grounds off Gremsey, approximately 6 nautical miles from the Island. In the beginning of September, the Russian fishing fleet moved east of Langenes. When the Andenes left, the depot-ships were anchored leeward of Langenes, outside of the territorial waters, and the fishing vessels were operating 50 to 100 nautical miles off the coast.

"Everything gives the impression that the Russian catch was large. Russian fishing vessels were constantly loading their catches into the depot-ships, and large flocks of gulls stayed near the vessels. The barrels on board the depot-ships were steadily reduced, and it was evident from the water line on these vessels that they were continually taking on fish."

* * * * *

IMPORT RESTRICTIONS MODIFIED ON CERTAIN FISHERIES SUPPLIES: The Icelandic Economic Board announced on August 12, 1950, that importers are no longer required to procure import and exchange licenses for a limited list of articles (including fish hooks, nets, and certain yarns and cordage for fishing purposes), effective from August 7, according to an American consular dispatch dated August 17 from Reykjavik. However, the transfer of foreign exchange is still controlled by designated Icelandic banks and all imports for which exchange has not been allocated are temporarily excluded from Iceland.



Italy

SPONGE FISHERY: Production: Italian-controlled sponge banks yielded approximately 12 metric tons of sponges in 1948 and 18 tons in 1949, states a consular dispatch from Florence dated September 15. Production has steadily increased since the end of World War II. Official statistics reveal, however, that sponges unloaded in Italian ports totaled 56 tons in 1948 and 98 tons in 1949. Since there are now relatively few areas where Italian sponge vessels can operate and in order to augment their own insufficient supply, Italian fishing boats often exploit sponge banks now controlled by other countries and buy sponges from foreign boats while on fishing trips.

Sponges are to be found mainly in the "Arcipelago Cavallo" (Horse Archipelago), a group of sponge beds stretching along the coasts of Greece, Sicily, Libya, and Tunisia; and along the coasts of Dalmatia, on the Adriatic Sea.

Before World War II, Italy could draw her harvest from the waters of Tripoli, Libya, and Dalmatia, as well as those of Sicily, whereas she must now confine her activities to the latter area. These latter banks ("Banco Fango" - Mud Bank, "Banco Morte" - Death Bank, and "Banco Numeri" - Number Bank) are insufficient to supply the demands of the Italian market.

Persons in the field believe that considerable surpluses from previous fishing seasons are being held by speculators in Sicily. It is estimated that this year's (1950) yield has been better than in recent years.

There are now only about six sponge firms of any importance in Italy. The several firms existing in Livorno prior to World War II were entirely destroyed; no steps have been taken to reactivate the industry in that area. Most of the actual work of cleaning, sterilizing, and preparing sponges is done by each firm separately.

Employment: Less than 200 persons are employed in legitimate sponge fishing; an unknown number are said to deal in sponges which have been obtained outside the

Italian sponge banks. Processing (bleaching, washing, cutting, packing, etc.) is simple and requires no expensive or complicated machinery. Estimates are that a maximum of 300 workers, mostly young girls, are employed in this work; no special skills or training are required. The preparation of the required bleaches is generally carried out by each plant independently and requires the services of not more than a few dozen laborers.

The principal complaint of people in the trade is that the finer-quality sponges are to be found in banks outside the Italian area; and they maintain that it is essential to the success of this industry that the Government effect an agreement with its Mediterranean neighbors to permit sponge fishing in some of the more desirable sponge banks.

Consumption: The home market is stated to absorb about two-thirds of local production, all but a very small part of which is said to be for industrial use. The principal buyers are automobile producers, a firm producing railway rolling stock, tanneries, state railways, and air lines. Certain requirements cannot be fulfilled by the national industry for lack of good-quality raw sponges (e.g., those used in the ceramic industry). Among motor-scooter and automobile manufacturers, demand has increased in the past few years for sponges for cleaning, washing, and polishing motor bodies.

It is commonly held by the trade that home consumption for good-quality sponges, if available, could be increased considerably.

The present prices of raw unprocessed "Arcipelago Cavallo" sponges range from \$2.25-\$2.70 per pound. Prices of partly processed sponges are quoted as follows by wholesalers:

Type	Quality	Price per pound
		\$
Diver-fished, raw, cleaned, sorted	first	9.55
Diver-fished, raw, cleaned, sorted	second	4.77
Diver-fished, raw, cleaned, sorted	third	2.39
Net-fished		2.73

Exports: Present exchange restrictions in certain areas, notably South America, curtail exports.

Table 1 - Italian Sponge Exports, 1948-49		
Type	1949	1948
	(in metric tons)	
Raw sponges, ordinary quality	44.6	17.
Raw sponges, fine quality	3.6	.2
Processed sponges, ordinary quality.	6.6	5.2
Processed sponges, fine quality	1.2	.9
Total	56.0	23.3

4.1 metric tons in 1948 to .3 tons in 1949.

Export regulations: There are no particular regulations governing the export of sponges. However, certain general trade restrictions have cut out much of the prewar trade in this commodity, particularly with Argentina and other South American countries.

Belgium - Luxembourg were the largest importers of both raw and processed sponges, with Switzerland second as importer of raw sponges, and the United States second for the processed type. Exports of processed sponges to the United States dropped from

Imports: The trade is very anxious that agreements be made with other countries controlling sponge banks in order to make raw sponges, particularly the better grades, available for Italian industry. Inadequate trade agreements and financial barriers are at present a hindrance to new developments. Yugoslavia, Greece and certain former Italian colonies are the sources from which processors would like to draw. In view of the existence of the local industry, it does not seem likely that permission for import from the United States will be granted.

Channels of Distribution: Processors generally sell to wholesalers, shops, and industrial concerns through selling agents or through representatives.

Outlook and Potentialities: The industry's outlook appears rather satisfactory. Domestic consumption will probably increase, particularly in view of the many industrial uses to which sponges are now put. Rubber or plastic sponges do not offer much competition, as they are too brittle for industrial use and are considered unsanitary for toilet use, since they soon become sticky and cannot be properly cleaned.

The greatest obstacle to further postwar expansion of the sponge industry doubtless is the very restricted area now open to Italian sponge fishers. Only a substantial reduction in price would increase trade with the United States.



Israel

TO FISH IN NORTH SEA AND THE ATLANTIC: An Israeli company has bought the first of three deep-sea fishing vessels in France, a September 11 American consular dispatch from Tel Aviv reports. The fleet will use Ostend as a base for fishing operation in the North Sea and the Atlantic.



Japan

MOTHERSHIP OPERATION FOR TUNA IN THE EQUATORIAL PACIFIC OCEAN:^{1/} The Japanese mothership operation for tuna in the equatorial Pacific Ocean consists of two fleets. The larger fleet includes a 10,600-metric-ton mothership (Tenyo Maru No. 2) and 25 catcher vessels ranging in length from 75 to 110 feet, which left Japan in mid-June. The smaller fleet, which includes the 2,900-ton refrigerated mothership Kaiko Maru and 12 catchers, left Japan July 10. Both of these expeditions operate under the authority of SCAP. A SCAP representative accompanies each expedition to insure compliance with the provisions of SCAP directives, and a representative of the High Commissioner for the Trust Territories of the Pacific Islands accompanied the Tenyo Maru No. 2 as advisor and observer for the High Commissioner, and to conduct scientific studies. This observer is a member of the Pacific Oceanic Fishery Investigations staff of the U. S. Fish and Wildlife Service, and he returned to Honolulu on September 29 following a 15-week trip with this Japanese expedition. The motherships are refrigerated vessels ordinarily used in the Antarctic whaling operations, and the catcher vessels are Japanese long-line fishing vessels from several Japanese ports.

^{1/}SEE COMMERCIAL FISHERIES REVIEW, JULY 1950, P. 46; JUNE 1950, PP. 52-4.

Each of the fishing vessels in the larger of the two fleets ran 300 to 400 baskets of gear daily, with an average of about 350 baskets, according to the Service's observer. This represents a total main-line length of 65 miles per boat per day with hooks at 150- to 175-foot intervals. The average catch per 100 hooks per day fished was 3.95 fish of all species (tunas, spearfish, and sharks).

Fishing operations were conducted offshore from 140° to 160° E. longitude and from 1° to 5° north latitude. The fleet moved from west to east in the area, ending the trip near 160° E. longitude.

The most important biological observations recorded on this expedition were the 503 sets of morphometric data which will be used in the study of tuna races and migrations. Length measurements were taken on 1,077 yellowfin. The yellowfin ranged from 5 to 90 pounds but the greater part of the catch of this species fell between 60 and 75 pounds in weight.

The Japanese mothership tuna expeditions as of September 28 processed 9,474,155 pounds of tuna, marlin, and shark, according to the October 7 Weekly Summary of SCAP's Natural Resources Section.

Tenyo Maru No. 2 had processed 6,138,024 pounds in 11 weeks of operation. Kaiko Maru had processed 3,336,131 pounds in 11 weeks. The Tenyo Maru No. 2 ceased operations on September 2 and returned to Tokyo on September 14. The Kaiko Maru ceased operations on September 28 and was expected to return to Japan on October 14, 1950. Detailed production data are shown in the following table.

Production of Japanese Mothership Tuna Expeditions in the Equatorial Pacific Ocean as of September 28							
Ship	Yellowfin Tuna		Other	Marlin	Shark	Others	Total
	Round	Fillet	Tuna				
	(in pounds)						
Tenyo Maru No. 2	2,495,491	1,271,007	399,210	1,224,484	575,055	172,777	6,138,024
Kaiko Maru	2,397	1,849,335	265,957	911,243	238,138	69,061	3,336,131
Total	2,497,888	3,120,342	665,167	2,135,727	813,193	241,838	9,474,155

First-grade yellowfin and albacore tuna of sizes suitable for export and canning were frozen whole. The remainder was filleted into quarters and pan-frozen.

JAPANESE GOVERNMENT



Mexico

SHRIMP FISHING OFF MEXICO UNDER CLOSE SURVEILLANCE: The Mexican naval authorities are keeping a close watch on the shrimp fishing off the Mexican east coast, according to the September 21, 1950, issue of El Universal, a Mexican newspaper. The following is a translation of the article supplied by the American Embassy at Mexico, D. F.:

"There has been a great deal of insistence lately that United States boats are conducting clandestine fishing in the Campeche region, taking large quantities of shrimp without legal authorization and without paying the prescribed taxes. However, we were informed today in the Ministry of Marine that strong vigilance is being exercised in that zone and that no such irregularities exist.

"What is actually happening is that the foreign fishermen are taking advantage of the periodic migrations of this valuable crustacean to capture it in the high seas, at a distance of 30 or more miles from the coast. There Mexico has no jurisdiction, as boats in this position are outside of national territorial waters and may conduct whatever activities they wish, without any control.

"In order to counteract these activities, at least in part, the naval authorities are encouraging the creation of fishing fleets of Mexican companies or cooperatives to go out into the open sea as the others are doing."



Netherlands

STUDIES TRAWL-FISHING INDUSTRY: A commission to study the Netherlands trawl-fishing industry and to make recommendations, among other subjects, on the improvement of equipment and methods of financing such improvements, was appointed by the Minister of Agriculture, according to a September 20 American Embassy dispatch from the Hague.



Norway

RESULTS OF EXPERIMENTAL FISHING EXPEDITION OFF WEST GREENLAND: The results achieved by the Norwegian Directorate of Fisheries' experimental fishing expedition off the west coast of Greenland during the past summer were announced by the Directorate's Fishery Consultant M. O. Kristensen in the September 7, 1950, issue of Bergens Tidende.

A September 4 report from Aalesund indicated that the Directorate of Fisheries' practical fishing tests off west Greenland this summer had not been very successful due to the unfavorable weather conditions, according to the Fishery Consultant's statement as reported by the American consulate at Bergen. However, in spite of the weather conditions, the results of the tests on dragnet fishing "by pairs"1 ("pareja") were very encouraging.

The expedition left Aalesund on July 21 with the freighter Fjellberg. Equipment to be tested was the Spanish "pareja" nets, also trawl-net dories and trawl nets--the same trawl nets which were used for experimental fishing at Lofoten the past two seasons.

The Directorate of Fisheries leased the fishing vessels Eldøy and Fosnavaag for "pareja" fishing, but Fishery Consultant Birger Rasmussen used the Eldøy for scientific investigations, i.e. for taking hydrographical measurements, marking of fish, etc. The vessels were leased for three weeks.

Because of the bad weather and the short time allowed for the tests, work was concentrated on fishing with "pareja" nets. In fact, no test was made with trawl

nets. Tests were made at the different fishingbanks--Lille Hellefiskebank, Bananabank, Fyllabank, Fiskenesbank, and Danabank. Conditions on the bottom were not especially satisfactory on the southern banks, but at the Fyllabank and Bananabank conditions were fairly good, so most of the tests were made there.

Kristensen said: "I must say that results were encouraging, not to use too strong an expression. In some instances the catch from a single test drag resulted in two tons of salted fish. To be able to make comparison, lines were placed out during the night. Catches from lines were from 300-400 fish per stump. One stump consists of approximately 20 lines with about 2,000 hooks. Working such a stump takes approximately four hours, while one drag with the 'pareja' net is made in a couple of hours. In one day, six drags were made with the "pareja" net and, if we had worked in shifts and trawled through a 24-hour day, we could have managed approximately 10 drags per day....Trawl fishing had also the advantage of netting the big fish, which are too satiated to bite on the hooks."

It is pointed out that it is not possible to use the "pareja" trawl method during the entire season. It may only be used with hopes of good results during a few months in the middle of summer when the fish stream into the shoal banks. Experience has shown this period to be a slack season for line fishing. The tests made with the "pareja" net gave the positive results hoped for, but the equipment may possibly have to be improved somewhat. "I am of the opinion that it is possible to use 'pareja' nets in such a way that it will be both profitable and efficient," Kristensen states. "At least the tests made have proved that it is possible to fish with this equipment off west Greenland; results are in fact much more promising when considering the fact that we were not acquainted with conditions on the bottom of the banks."

This year's trial tests reveal that there is hope of making cod fishing easier for the fishermen off Greenland. It is extremely hard toil to work at line fishing four or five months at a stretch. On every single fishing vessel, close to half a million fish hooks must be baited during the season, on some vessels even more. If the vessels could work at "pareja" fishing for a few months in the middle of the season, and that should be possible, it would mean a welcome change in work for the fishermen. "If this change is not made, I am afraid it will be difficult to get a full crew for the Norwegian line-fishing vessels. This year some of the vessels could not be sent fishing due to scarcity of fishermen," says Kristensen.

A "pareja" net costs from \$725-\$870. Complete line-fishing equipment costs approximately \$3,000, not counting the expense of bait. One vessel uses 300-400 cases of bait per season at a cost of about \$4.35 per case. Besides this, the equipment is so worn after one season that it must be partially renewed before it can be used again. It is calculated that the vessels need 4 or 5 "pareja" trawls per season, and only partial replacement is needed from year to year.

* * * * *

SAFETY NET FOR PURSE-SEINE CATCHES: A new fishing device has made it possible to save even the largest purse-seine catches, according to the Norwegian newspaper Tidens Krav, quoted by the September 14 issue of Fiskaren. A type of security or safety net, which already has been tested with excellent results, has been devised by Ole Hasseloesaether, from Kjonnoy, near Kristiansund. The motor vessel Ullasund, which was high boat during the winter herring season, experimented with the newnet and with its help saved a haul of about 500 metric tons of herring.

* * * * *

ESTIMATED FISH CATCH FOR 1950: It is expected that the total Norwegian fish catch in 1950 will reach a record total of 1,263,500 metric tons as compared to 1,054,000 tons in 1949, a September 1 semi-annual economic report from the American Embassy at Oslo states. This year's catch will probably consist of 912,300 metric tons of herring and 351,000 tons of cod and other species, compared to 718,723 tons of herring and 336,000 tons of cod and other species in 1949.



A NORWEGIAN HERRING VESSEL STEAMING TO PORT WITH A FULL LOAD OF HERRING.

Table 1 - Norwegian Herring "Winter," "Spring," "Fat," and "Small" Catch, 1949-50

Type of Herring	1950	1949
	(in metric tons)	
"Winter" and "spring"	771,342	567,486
"Fat"	1/ 24,994	21,766
"Small"	1/ 99,975	101,086
Total	896,311	690,338
1/Estimated.		

HERRING FISHERIES, 1950:1/

Although the 1950 winter herring fishing season was short, abundance of fish was great. Daily catches at times reached peaks overtaking shore facilities for marketing and processing. Fishing had to be discontinued for one week; this resulted in a presumed loss of an additional 93,000 metric tons which the fisheries would otherwise have yielded.

A catch of winter herring of 771,900 metric tons in 1950 was almost as high as the all-time record catch of 820,260 tons in 1948 (table 1).

1/DOES NOT INCLUDE BRISLING FISHERY.

Table 2 - Norway's Utilization of the Winter-Fished Herring, 1948-50 ("Winter" and "Spring")								
Year	Total Catch	Utilization						
		Exported Fresh	Fresh-Home Consumption	Salted	Canned	Processed (Oil and Meal)	Bait	Other
1950	771,342	56,544	3,720	59,892	10,044	634,260	6,882	-
1949	567,486	120,714	4,929	125,736	13,485	294,624	7,905	93
1948	820,260	119,691	7,533	118,110	17,763	540,051	17,112	-

Table 3 - Norwegian Production of Fish Meal and Herring Oil, 1948-50			
Product	1950	1949	1948
	.. (in metric tons) ..		
Herring oil	45,000	26,800	40,500
Herring meal	120,000	72,000	110,000
Other fish meal ...	5,000	13,637	11,904
1/Estimated.			

Although the 1950 catch was large, the export market demand for herring products was held to be the poorest in more than 25 years, with the exception of the war years. As a result, greater quantities than ever before were allocated to the production of herring oil and meal (table 3).

NOTE: CATCH DATA CONVERTED FROM HECTOLITERS TO METRIC TONS ON THE BASIS OF 10.75 HECTOLITERS EQUAL 1 METRIC TON OR 1 HECTOLITER EQUALS 0.093 METRIC TONS.

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NEW WHALING RESEARCH LABORATORY: One of Norway's leading whaling operators, Consul Lars Christensen, has announced establishment of a large research laboratory in Sandefjord, the Norwegian Information Service reported on September 14. Main task of the new institute will be to find better means of utilizing byproducts of whales, with a view to closer collaboration between the farming and whaling industries.

Christensen is especially interested in the possibilities of producing animal fodder containing APF (Animal Protein Factor) in concentrated form. Recent research, initiated in the United States, has proved that infinitesimal amounts of APF is sufficient, but also essential, to insure healthy animal growth. It is only 1½ years since the first results of APF could be proved, but already during the last whaling season Christensen's company was able to produce APF-rich whale meal on a small scale.

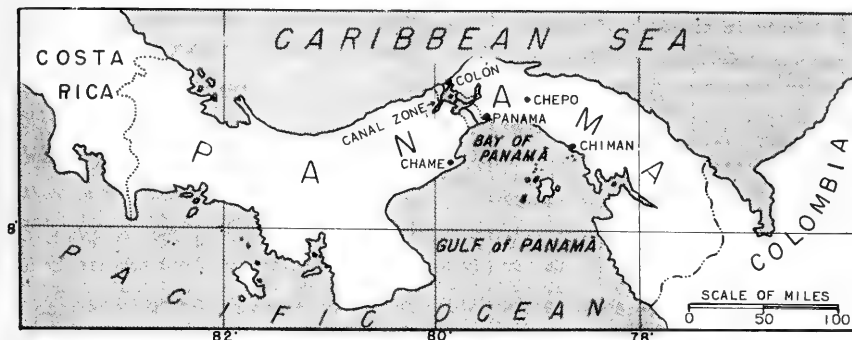
This coming season, the research will be expanded to ascertain how APF concentrates can be made from whale byproducts in large quantities.



Republic of Panama

SHRIMP FISHERY: Development of the Panamanian shrimp fishery is claimed to be due to the efforts of an American citizen who, approximately a year ago, imported a vessel and equipment suitable for general fishing, a report dated September 6 from the American Embassy at Panama City states. When the vessel found shrimp in its nets instead of fish, it concentrated on fishing for shrimp.

Panamanian waters, particularly those on the Pacific Coast of the country, have always been known to be productive of edible fish, including shrimp. Since Colonial days, all fish taken were for local consumption. There are no facilities for canning, smoking, drying, salting, pickling, or otherwise preparing fishery products for export.



Most of the residents of the islands and lands around bays have engaged in subsistence fishing in connection with farming. Until a year ago, there was only one private concern which bought fish from the fishermen to be sold to hotels, clubs, restaurants, and the Canal Zone. This firm, which handled a very large percentage of the country's total Pacific fish catch, also engaged in shipping fish in ice to Colon on the Atlantic side of the Isthmus.

Information as to the abundance of fish, including shrimp, is based on estimates of fishermen who have always claimed that both shrimp and spiny lobsters are plentiful in the Bay of Panama.

Type of Shrimp: The Panamanian shrimp are of a pale blue color and are reported to be abundant, with sizes ranging from 10 to 15 heads-off shrimp per pound. They may be any one or several of four species found in the Gulf of Panama.

Location of Shrimp Grounds: Shrimp are found mainly in the Gulf of Panama. Their exact whereabouts, however, vary in accordance with the season. The best shrimp grounds are located 30 to 80 miles offshore of Chame, Chiman, Chepo, and Chepigana.

Season: Shrimp are found in large quantities from September to December, the period of greatest abundance being the time of the "spring tides" occurring usually in October and lasting about a week. They are somewhat scarce throughout the cold-water period, i.e., from December to May.

Production: Annual production of shrimp was officially estimated at around 30,000 pounds until the end of 1947.

The total shrimp catch in 1949 (not including crayfish) in the Gulf of Panama was 131,988 pounds, while the spiny lobster catch was a little less than 93,000 pounds.

At present there are three concerns engaged in large scale shrimp fishing in Panama. One of these, which owns two fishing vessels, did not operate the last two weeks in August because of damage to boats. This firm has in the past been a steady supplier of shrimp to Panama and the Canal Zone.

Panama's Shrimp and Spiny Lobster Catch in the Gulf of Panama by Months, 1948-49		
Month	1949 Pounds	1948 Pounds
January	32,200*	{ 61,298
February	15,749*	
March	17,340*	-
April	13,886	5,007
May	24,791*	14,169*
June	18,350*	9,770*
July	27,123*	32,882*
August	21,939*	26,295*
September ...	19,510*	13,200*
October	9,614	19,332*
November	17,794	5,015*
December	6,605	9,151
Total	224,901*	196,119*
*Includes crayfish production.		
1/Not available by months.		

Number of Vessels Engaged in Shrimping:

There are in use eight fishing boats equipped with Diesel engines, 35 to 45 feet long, adapted to shrimp fishing. The cost of the vessels is claimed to be between \$10,000 and \$20,000 each. The shrimp nets are of United States manufacture. The boats and equipment are said not to compare favorably with those employed in the United States.

Outlook: The present catch cannot be used as any indication of the potential yield in this area. It is claimed that the catch easily exceeds local market demands, and that at present there are weekly shipments of frozen shrimp to New York by Panama Railroad boats and others sailing from Cristobal (Canal Zone) in quantities of from 6,000 to 15,000 pounds.

The lack of adequate quick-freeze facilities is handicapping production, an official of one of the concerns in the shrimp fishing industry stated, and there is a very definite need for such equipment. He added that freezers received from California (which reach freezing point in one-hour's time in California) require approximately five hours in Panama to provide identical results.



Sweden

SOVIETS REPORTED ORDERING MORE FISHING VESSELS FROM SWEDEN:^{1/} It was reported unofficially that the Soviets are attempting to order from the Swedish Association of Smaller Shipyards more than the 29 fishing vessels already on order, a September 19 American Embassy dispatch from Stockholm states. The Soviets wish the Association to take over the contracts for the 21 vessels originally placed with small shipyards outside of the association, which have been unable to fulfill delivery. In addition, the Soviets are also said to be negotiating for changes in the construction which are not standard for fishing vessels and which will permit the vessels to be used for purposes other than fishing. The association appears to be asking for a considerable increase in delivery price to cover these changes.

^{1/}SEE COMMERCIAL FISHERIES REVIEW, FEBRUARY 1950, P. 60.



Union of South Africa

A REVIEW OF THE FISH CANNING INDUSTRY: An analysis of the South African canning industry was published in an article ("A Review of the South African Canning Industry," by W. S. Parker) which appeared in the May 1950 issue of the South African Bankers' Journal. A copy of this article was made available by the American Consulate at Johannesburg, and an abstract of that part of the article which deals with the fish canning industry follows.

Growth and Structure of the Industry: The story of the South African fish canning industry before 1939 is one of slow growth; a steady market, found principally in France and in other Continental countries, absorbed the full output of established producers, and processing was confined mainly to crawfish (spiny lobster). The location of the industry was, of course, initially determined mainly by proximity to the fishing grounds, and canneries were established on the coasts of South-West Africa and Cape Province. The industry is still centered in these areas, but among recent developments has been the establishment of a crawfish processing factory on Tristan da Cunha.

The war limited the entry of foreign canned fish into the Union and the opportunity for expansion thus given to South African producers was fully exploited. The canning of such fish as snoek, pilchards, mackerel, maasbanker, harders, albacore and stockfish was developed, and the production of byproducts, such as fish meals and oils was greatly expanded. From the outbreak of World War II most of the surplus production of South African canned crawfish was purchased by the British Ministry of Food, so that throughout the war years the crawfish industry was enabled to maintain full production. The expansion of the fish canning industry as a whole was, in fact, almost as remarkable as that of the fruit and vegetable canneries.

The total value of the output of the industry, including byproducts, which had averaged approximately £348,000 (about \$1,643,000) in the years 1932 to 1939, rose in 1946-47 to £2,287,268 (\$9,172,000) while the number of factories in operation increased from 22 in 1929 to 28 at the end of war. Wages paid to all employees amounted to £60,062 (\$240,000) in 1929, £62,051 (\$273,000) in 1939, and £184,648 (\$735,000) in 1944, although the total number of workers in the industry rose only by 351 during that period, from 1,311 to 1,662.

This development has been guided and assisted to no small extent by several organizations representing the various sections of the industry. The provisions of the 1944 Fishing Industry Development Act enabled the establishment in October 1944 of the Fisheries Development Corporation of South Africa, Ltd., to promote the expansion of the South African fishing and fish-canning industries. Other organizations directly concerned with the expansion of fish canning in the Union and the marketing of the industry's products are the South African Food Canners' Council, Inc., and the South African Rock Lobster Packers' Association, while problems relating to the processing of fish and the extraction of byproducts are dealt with by the Fishing Industry Research Institute. Half the cost of this latter organization is borne by the fish canning industry and half by the Government-sponsored Council for Scientific and Industrial Research.

Recent events have shown, however, that, in addition to the services of organizations devoted to research and marketing, a new industry has need of the guidance of well-defined standards of quality for its product, standards which must be rigidly enforced. Through the lack of such standards, goods of inferior quality were

marketed on occasion in recent years by the South African canning industry, both at home and abroad. To ensure adherence to a high standard of quality in the future, a system of inspection has been instituted, and to this end the South African Bureau of Standards undertook the construction of a table of standards for the range of products of the industry.

The Market: During the war, imports of canned fish and fish products largely fell away, while at the same time demand was augmented by the requirements of the armed forces. The total production of South African canneries was almost fully absorbed by the home market and the British Ministry of Food, which also sustained the crawfish canning industry.

Since the war, no appreciable contraction in demand has been noticeable, largely due at first to buying on the part of the British Ministry of Food, while a broad new market for crawfish tails, sold as Cape rock lobster, has been successfully developed in the United States. As in the case of South African canned fruit, jam, and vegetables, the world shortage of food provides large potential markets for canned fish and fish products. Resources of the raw materials of the industry are considerable; the fishing grounds off the South African coast are largely untouched; crawfish, the export of which is now limited on a quota system in order to conserve resources, are to be fished off Tristan de Cunha at an annual planned rate of 1,600,000 crawfish, and it is likely that these conservation measures together with the development of the Tristan industry will enable a profitable export trade in crawfish products, of an annual value of over £900,000,^{1/} to continue for a considerable number of years. Research into the commercial possibilities of plankton, resources of which are virtually inexhaustible, indicate that once satisfactorily marketable forms of this marine growth are devised, a profitable and extensive branch of the canning industry could be established.

The demand for shark liver oils has recently eased, but fish oils find a ready market and the South African product, which is concentrated and of good quality, is able to compete with the products of Argentina, Norway, and the United States.

A further potential market which is engaging the attention of South African fish canners is the development of the non-European trade within the Union. Expansion in this quarter depends largely on the production of a low-priced commodity of suitable and consistent quality, and on the ability of the non-European consumer to afford this addition to his diet. The possibility of extending the home market in this direction is small, however, owing to the limited purchasing power of the consumer group in question and the difficulty which will be met in attempting to substitute fish for any portion of the natives' accepted diet. Nevertheless, the present shortage of meat provides an opening for skilful salesmanship.

A wide market for canned fish products is available, therefore, but there are indications that the foreign market is becoming more competitive: the reduction in price on the Union market in 1947, for example, was due to the need to compete with lower priced imports; and again, in the United States market for crawfish, competitors from the Bahamas, Cuba, Mexico, and Australia are appearing. While in the United States the South African crawfish is particularly favored, as the tails are larger than the varieties offered by most other exporters, one competitor, Australia, can compete both in the size and flavor of its product; in addition, the price of the Australian tails is below that at which the South African product can be sold. It is apparent, therefore, that South African producers no longer enjoy a sellers' market abroad; at home the market can be described as steady but not strong.

^{1/}ABOUT \$250,200,000.

While it is probable that further reductions in cost of production will have to be effected in order to sell South African canned fish on a fully competitive market, one factor which has already led to a lowering of costs has been the development of the canning of fish other than crawfish, thus enabling factories to work throughout the year instead of producing in the crawfish season only. As a result, overhead costs have been distributed over a greatly increased volume of output and the subsequent fall in the cost of production for each unit of the product has been reflected in lower prices to the consumer.

Conclusion: In conclusion, then, it can be said of the canning of both farm- and fish-products in the Union that the continuance of a wide market is essential for the maintenance of the industry's prosperity, since capitalization is now on a scale which demands an outlet for a large volume of production, and the number of workers whose livelihood would be affected by any significant contraction in output is considerable. To ensure adequate sales it would seem to be essential to reduce costs of production and so to lower the selling price, as overseas markets are becoming increasingly competitive. In this connection, as in relation to most secondary industries in the Union, the low purchasing power of the vast majority of the people denies the enjoyment of the economics of large scale production without the development of a large export market.

The fish canning industry is assured of readily available and plentiful supplies of cheap raw materials, and the industry is not handicapped to any great extent by natural factors. Nevertheless, the canneries are in competition with large-scale overseas industries, based on broad markets and having at their disposal greater resources of technical knowledge and traditional skill. It is therefore essential for this section of the canning industry to maintain a competitive selling price, and for the industry as a whole to guard against deviations from high standards of quality.

The industry as a whole has enjoyed great advantage in its growth; a period of consolidation rather than expansion is now necessary to retain the benefits of its maturity.



United Kingdom

BRITIAN PLANS TO SELL KIPPERS IN U. S.: Plans for a sales campaign to sell Scottish kippers in the United States and Canada are completed, according to the August 26 Fish Trades Gazette, a British fishery periodical.

The kippers will be cellophane-wrapped in pairs, deep-frozen, and shipped to American and Canadian cold-storage warehouses at strategic sales points. Sales will be made from September through May by a London merchant bank through its American trading company, who in turn will sell directly to food and fish brokers.

The first year's export sales target is 80,000 cases (44 kippers to a case). Sales will open in test areas. The campaign will not be confined just to hotels, restaurants, and the catering trade, but will also aim to promote and sell kippers as a home product. Newspaper, radio, possibly television, and public relations will be employed as promotion aids to the sales campaign.



Uruguay

GOOD PROCESSING RESULTS OBTAINED WITH URUGUAYAN SEALSKINS: Satisfactory results were obtained by an American fur company in processing 10 of 31 Uruguayan sealskins (Lobos)—a simple shipment made by the Servicio Oceanografico y de Pesca (SOYP), states a September 27 American Embassy dispatch from Montevideo.

The American fur company stated that if skins equal in quality to those in the sample shipment were shipped, a good permanent market could be developed for these skins in the United States. Their value is estimated to be somewhere between the value of Alaska and Cape Hope sealskins. In the last spring auction in St. Louis, Alaska sealskins averaged \$64.20 each and the Cape Hope skins averaged \$21.89 each. However, it is estimated that the market presently is up at least 50 percent.

The Uruguayan Government owns a seal rookery at Isla de Lobos, about 70 miles from Montevideo. The herd on the Island is estimated to contain up to 300,000 seals.

This year an estimated 2,000 skins have been taken, although the season does not end until October 15. Selective methods were followed with only male seals being killed.



West Africa (British Colonies of Gambia, Sierra Leone, the Gold Coast, and Nigeria)

DEVELOPMENT OF FISHERIES PLANNED: Establishment of Fisheries Research Institute: A West African Fisheries Research Institute is to be established at Freetown, Sierra Leone, according to a September 23 American consular dispatch from Monrovia. It is estimated that a capital expenditure of \$554,400 will be necessary. This will be supplied by the United Kingdom, which will also contribute \$504,000 for operating expenses over a period of five years. This latter sum is to be matched by an equal amount from the colonies of Gambia, Sierra Leone, the Gold Coast,^{1/} and Nigeria.

Several buildings facing on Cline Bay, just outside of Freetown, have been acquired by the Institute from the British Admiralty for use as laboratories and administration use. One of the buildings will be used as a pilot plant for processing shark livers.

A research ship, costing around \$255,000, is to be launched the first part of 1951.

In addition to the actual research of the Institute, it is planned later to establish laboratories for training in research in tropical fisheries. The facilities of these laboratories will be made available to visiting scientists of all nationalities.

Programs Planned for Expanding the Fisheries: The ultimate purpose of the Institute is to make protein more available to the native populations of West Africa. In some areas the incidence of leprosy runs as high as one in nine of the population. It has been found that a high protein diet considerably reduces the incidence of leprosy and there are, of course, other benefits.

Prior to World War II, Scandinavian dried fish was available for about 2 cents a pound, which was the equivalent of four to five pounds of canned fish. This dried

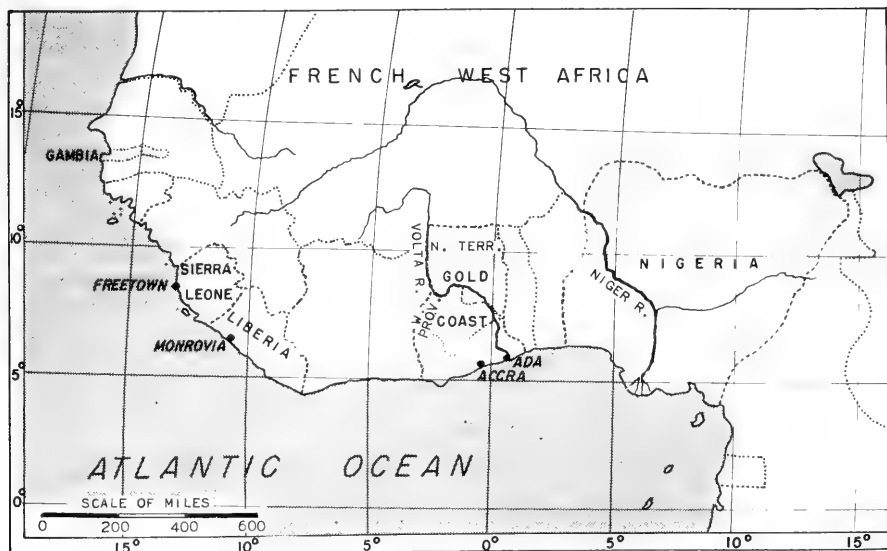
^{1/}ALSO SEE P. 57 OF THIS ISSUE.

fish came chiefly from Greenland, but the increase in wages paid there since the war has resulted in pricing the dried fish out of the local market. The director of the Institute estimates that at present canned fish cannot be procured for distribution in the interior for less than 2 to 3½ cents a pound, which is too expensive for the native population. With a view to making cheap protein available, several different programs are being planned and started.

The humidity in West Africa is too high for heavy salt curing. Sun-dried fish, with a slight salt preservative, will keep for about two weeks in Sierra Leone without redrying and this will undoubtedly be one of the methods used. It is, however, desirable to preserve fish for longer periods.

The Torrey Research Station at Aberdeen, Scotland, has developed a smoking and drying kiln in the form of a wind tunnel. The kiln burns sawdust, uses steam pipes to maintain temperature control, and fans to dry the air. The smoke from the burning sawdust is also used in preserving. It is estimated that such a kiln can be locally constructed for \$420 and it is planned to build one.

This is the preserving method to be used: The fish is first boiled so that the flesh comes off the bones. The meat is then minced and spread on sieve-like drying trays, which are stacked in the smoke tunnel, and the fish is dried to about 4 percent moisture. It is hoped to package the dried fish in a newly-developed aluminum package costing about the same as a paper package. The packages will be 10 and 20 pounds each, and the market women will be able to sell the dried fish at from 1-1½ cents a cup (9½ oz.), thus securing the widest distribution of protein at a minimum cost. The dried fish looks like desiccated vegetables, but according to the Director it reconstitutes well and fish balls prepared from it are almost indistinguishable from fish balls made from fresh fish.



The shark liver project will be simply a pilot plant. This project was approved by the four colonies in August 1950, and has now gone to the United Kingdom for Treasury sanction. The Treasury had previously indicated its approval, so little delay is anticipated. Very simple equipment will be used—a tank for livers, an emulsifier to break it down, and reagents to neutralize it. The liver will be chopped up and emulsified, made slightly alkaline, and cooled to the critical point at which the oil separates from the water. This method eliminates scorching and the consequent reduction of the vitamin A content. The liver residue has a very high content of the animal protein growth factor, which can be used for animal feeding.

A fish pond has been started at Newton, about twenty-five miles from Freetown. At present, a kind of perch (*Tilapia melano pleura*) is being grown. This is a vegetable eater and is being used as a starter. Later, it is planned to add two other kinds of fish so that there will be surface-feeding fish and bottom-feeding fish, as well as vegetable eaters. This will secure maximum use of the water. One difficulty which has been encountered is that West African fish reproduce so young that the food supply is insufficient to grow large fish. It is hoped that a type of bottom-feeding fish can be found that will eat enough of the smallest fish so that enough food will remain to enable some fish to grow large, and it is considered possible that an abundance of food might result in a change of the breeding pattern.

Another problem which is being investigated is the development of vegetable-eating fish that will not be destructive of rice paddies.

Offshore and deep-sea fishing also will be investigated. Bottom fish and pelagic fish are the principal sources. Investigations have so far failed to reveal any concentrations of bottom fish, which appears to be fairly evenly and not densely distributed over the bottom. The pelagic fish appear to be migratory, but the migrations do not appear to be related to breeding, as fish of all different sizes pass the coast at the same time. Although it is not yet established as certain, the water temperature appears to be the determining factor. The principal pelagic fish are of the herring type (*Sardinella* sp.) and shad (*Ethmelosa* sp.). Both occur in dense shoals and should give a rapid return with the right equipment.

In addition, it is known that tuna, albacore, etc., occur, but the density, time, and conditions are all unknown, as is the amount of plankton.

The native fishermen, going to sea in hand-propelled canoes, are necessarily limited in the distance to which they can go and if this limit is even slightly exceeded, spoilage of the catch is the result. After sufficient investigations of conditions have been made, it is proposed to introduce the use of small motorized fishing boats, like the American purse-seine boats used in menhaden fishing. If this proves successful, it is hoped to introduce from one to three trawlers for each colony, the trawlers to buy at sea directly from the small motorized boats to be run by natives.



International

FAO TO INVESTIGATE FACTORS HAMPERING MARKETING OF FISH IN EUROPE: An examination of the factors hampering the marketing of fish in Europe will be made by a group headed by the Chief of the Economics and Statistics Branch of the FAO Fisheries Division, Mr. G. M. Gerhardsen, who has been assigned to the Organization for European Economic Cooperation (OEEC).

The apparent overproduction of fish in Europe, as compared to the actual demand, has become a matter of great concern. Although the fish which have been caught have been disposed of in some way or another, the outlets have been of an alarmingly unstable character.

When the OEEC Subcommittee on Fisheries considered the situation in July 1949, it felt that "there is a considerable scope for an over-all increase in consumption," but there are certain factors which obviously limit the possibilities. The subcommittee found that it was not possible to frame specific proposals for increased consumption of fish without first making a more detailed survey.

Upon the unanimous recommendation of the principal European fisheries administrators, it was decided that OEEC should seek the services of the Chief Economist of the FAO Fisheries Division for six months to act as head of a team of experts, who are to be nominated by the countries concerned. This team will conduct a survey of the factors limiting the consumption of fish in Europe, so that the necessary adjustments may be made to bring about an increased consumption. The survey will deal with such things as the structure of the distribution trade, transport, handling and storage facilities, structure and behavior of prices and finance, seasonal fluctuation in fish supply and quality, consumer preference, and, finally, government policy on quotas, import duties, and local taxation. It is felt that practical information on these matters would very likely make it possible for the governments themselves to make adjustments that would lead to the desired increase in consumption of fish and fisheries products.

* * * * *

SPECIAL SESSION OF FAO CONFERENCE: With the Food and Agriculture Organization's move to permanent headquarters in Rome scheduled for early in 1951, FAO's 63 member governments will meet for the last time at its Washington headquarters beginning November 3, 1950. A Special Session of the FAO Conference was called by the FAO Director-General, according to an October 23 news release.

It is expected that the session will continue through November 11. Preceding it, the 18-government Council of FAO met beginning October 25.

This year's FAO Conference, unlike the annual sessions held heretofore, is a special one, "limited (as recommended by the Council) to essential financial and administrative matters and to any other urgent questions which may arise requiring decisions by the Conference." The 1949 Conference, in addition to directing the transfer of FAO headquarters to a permanent location in Rome, also adopted the principle of biennial, rather than annual, Conference sessions. A full-scale Conference is not scheduled until the fall of 1951. Insofar as possible, the agenda will be limited to the headquarters transfer, financial questions, appointment of a Director-General and Council Chairman, admission of new members, and necessary revisions of the Constitution.

This year the Council, rather than the Special Session of the Conference, will conduct the annual review of the state of food and agriculture. This procedure is in line with the expectation that when the system of biennial Conference sessions is established, the Council will review the food situation in the off years, and make such recommendations as are called for.

Director-General Dodd will report to the Conference that arrangements have virtually been completed with the Italian Government for the transfer of the FAO staff

and equipment to Rome. The staff transfer will take place in four groups, sailing from New York for Naples on February 17, March 1, March 22, and April 4, 1951.

In Rome, FAO will occupy two buildings which the Italian Government has under construction. The first is expected to be ready in February, and the second by October.

Among other matters which the Director-General will bring before the Conference are:

1. The rapidly growing FAO expanded program for technical assistance. The report will cover requests for technical assistance received from member governments, and methods of handling them within FAO and in cooperation with other United Nations agencies.

2. A report from the FAO Committee on Commodity Problems established by the last Conference. Beginning with 1946, each FAO Conference has given great attention to commodity problems—particularly to surplus situations existing side by side with hunger in many parts of the world—and there have been several proposals for improving the distribution of basic foods. Much attention was given last year to a proposal, advanced by the Director-General, for the creation of an International Commodity Clearinghouse to provide a bridge across which surpluses could move into consumption. While member governments could not see their way clear to adopt this proposal, interest in the problem has continued high.

3. Action taken by FAO to prepare for relief and rehabilitation work in Korea in response to the resolutions of the UN Security Council and the Economic and Social Council.

The terms of six Council members—Brazil, Canada, Chile, Italy, the Union of South Africa, and the United States of America—also expire. The Conference will elect members to these places on the 18-government Council.

Four applications for membership in FAO are on the proposed Conference agenda. These are from the State of Cambodia, the Federal Republic of Germany, the Hashemite Kingdom of the Jordan, and the State of Viet-Nam.

* * * * *

SECOND MEETING OF THE INTERNATIONAL WHALING COMMISSION:^{1/} The Second Meeting of the International Whaling Commission was convened at Oslo, Norway, on July 17, 1950, according to the official report of the United States Commissioner to the Secretary of State. The Commission is established pursuant to the International Convention for the Regulation of Whaling, signed at Washington, December 2, 1946. The business of the Commission was continued on July 18, 19, and concluded on July 21, 1950.

During its deliberations, the Commission (1) considered the future relationships of the Commission with the Food and Agriculture Organization and other specialized agencies of the United Nations; (2) decided the next meeting of the Commission

^{1/}SEE COMMERCIAL FISHERIES REVIEW, JULY 1950, P. 57.

should be convened at Capetown, South Africa, on July 23, 1951; (3) considered recommendations made by standing committees; and (4) adopted certain regulations amending the Schedule annexed to the Whaling Convention of 1946.

The countries represented by Commissioners, and their advisors, having full voting rights in the Commission were as follows: The United States of America, Australia, Brazil, Canada, Denmark, France, Iceland, Mexico, the Netherlands, Norway, South Africa, Sweden, United Kingdom, and the Union of Soviet Socialist Republics. New Zealand and Panama were not represented. Argentina and Chile were represented by observers—these countries are signatories to the Whaling Convention but have not deposited their instruments of ratification. The Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, the Supreme Commander for the Allied Powers at Tokyo, and the Association of Whaling Companies were each represented by an observer.

At this meeting, among other actions, the Commission adopted the recommendation that countries who have not as yet ratified the 1946 Convention shall be notified that after the third meeting (July 1951) they will not have another opportunity to send observers.

The American Commissioner, Dr. A. Remington Kellogg, Director of the United States National Museum, Washington, D. C., was assisted by the following advisors: Dr. Hilary J. Deason, Chief, Office of Foreign Activities, Fish and Wildlife Service, U. S. Department of the Interior; Fred E. Taylor, Foreign Affairs Specialist, U. S. Department of State; and Harry Conover, Second Secretary, American Embassy, Oslo, Norway.

Inclusion of the quota of 1,250 humpbacks permitted to be taken south of 40° S. latitude within the annual limitation of 16,000 blue-whale units for the Antarctic whale catch was confirmed, and by this action, the interim decision made by the Chairman of the Commission was approved.

Certain minor recommendations regarding whaling laws and infractions were also adopted, and questionnaires and standard forms to be used by governments in reports to the Commission were approved.

The Contracting Governments are required under the 1946 Convention to decide within two years after the coming into force of that Convention whether the Commission should be brought within the framework of a specialized agency related to the United Nations, namely FAO. The Commission decided that so long as the Commission receives the office and staff facilities now provided by the United Kingdom Ministry of Agriculture and Fisheries, it should continue to be independent, as at present, since that is the most economical plan.

The Commission agreed to the following amendment to paragraph 6 of the Schedule, as amended in 1949 (new matter underscored), and this amendment will become effective November 1, 1950, unless a contracting government objects:

"6. It is forbidden to use a factory ship or a whale catcher attached thereto for the purpose of taking or treating humpback whales in any waters south of 40° South Latitude; provided that, in the pelagic whaling season 1950/51 a maximum of 1,250 humpback whales may be taken in these waters commencing on February 1."

The notification procedure provided for in paragraph 8(c) of the Schedule has not proven satisfactory as regards the reporting of the catch of humpback whales by factory ships operating in the Antarctic. Therefore the Commission added the following section to paragraph 8 (which becomes effective November 1, 1950, unless a contracting government objects):

"(e) On the basis of data on the number of humpback whales taken in accordance with the provisions of paragraph 6 and reported in accordance with subparagraph 8 (c), the Commission, or such other body as the Commission may designate, shall determine the date on which the maximum catch of humpback whales shall be deemed to have been reached and shall notify each factory ship and each Contracting Government four days in advance thereof. The taking of humpback whales in all waters south of 40° South Latitude shall be illegal after midnight of the date so determined."

Active and full participation by the United States in the work of the Commission is now facilitated by the approval, on August 9, 1950, of legislation to implement the 1946 Convention (P. L. 676, 81st. Cong.^{2/}). The President of the United States has appointed the permanent United States Commissioner and the Deputy United States Commissioner.^{3/}

^{2/}SEE COMMERCIAL FISHERIES REVIEW, SEPTEMBER 1950, P. 65.


^{3/}SEE P. 46 OF THIS ISSUE.




OLDEST TAGGED HALIBUT EVER CAUGHT

The oldest tagged halibut ever caught was landed this summer at Seattle, according to an August 15 report from the Service's Fishery Marketing Specialist stationed in that city.

The dressed halibut weighed 100 pounds and was 25 years old. Originally caught and tagged by an International Fisheries Commission research vessel in 1935 on one of the halibut banks off the coast of British Columbia, the halibut was retaken by a commercial fishing boat only a short distance from where it was released 15 years ago.



FEDERAL ACTIONS



Executive Orders

INTERIOR TO BE REPRESENTED ON TRADE-AGREEMENTS COMMITTEES: Representation of the Department of the Interior on the Interdepartmental Committee on Trade Agreements and the Committee for Reciprocity Information was provided for by an October 12 Executive Order from The White House. The same persons are members of both committees. The text of the order is as follows:

EXECUTIVE ORDER

AMENDMENT OF EXECUTIVE ORDER NO. 10082 OF OCTOBER 5, 1949 PRESCRIBING PROCEDURES FOR THE ADMINISTRATION OF THE RECIPROCAL TRADE-AGREEMENTS PROGRAM

WHEREAS EXECUTIVE ORDER NO. 10082 OF OCTOBER 5, 1949 (14 F.R. 6105) ESTABLISHES THE INTERDEPARTMENTAL COMMITTEE ON TRADE AGREEMENTS AND THE COMMITTEE FOR RECIPROCITY INFORMATION, EACH TO CONSIST OF PERSONS DESIGNATED FROM THEIR RESPECTIVE AGENCIES BY THE CHAIRMAN OF THE UNITED STATES TARIFF COMMISSION, THE SECRETARY OF STATE, THE SECRETARY OF THE TREASURY, THE SECRETARY OF DEFENSE, THE SECRETARY OF AGRICULTURE, THE SECRETARY OF COMMERCE, THE SECRETARY OF LABOR AND THE ADMINISTRATOR FOR ECONOMIC CO-OPERATION; AND

WHEREAS IT WOULD BE IN THE PUBLIC INTEREST TO PROVIDE FOR THE REPRESENTATION ON SAID COMMITTEES OF THE DEPARTMENT OF THE INTERIOR:

NOW, THEREFORE, BY VIRTUE OF THE AUTHORITY VESTED IN ME BY THE CONSTITUTION AND STATUTES, INCLUDING SECTION 332 OF THE TARIFF ACT OF 1930 (46 STAT. 698) AND THE TRADE AGREEMENTS ACT APPROVED JUNE 12, 1934, AS AMENDED (48 STAT. 943; 57 STAT. 125; 59 STAT. 410; PUBLIC LAW 307, 81ST CONGRESS), THE SAID EXECUTIVE ORDER NO. 10082 OF OCTOBER 5, 1949 IS HEREBY AMENDED BY ADDING AFTER THE COMMA FOLLOWING THE WORD "DEFENSE," IN THE SECOND SENTENCE OF THE PARAGRAPH NUMBERED 1 THEREOF, THE WORDS "THE SECRETARY OF THE INTERIOR,."

/s/ HARRY S. TRUMAN

THE WHITE HOUSE
OCTOBER 12, 1950.

NOTE: ALSO SEE P. 84 OF THIS ISSUE.

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PRESIDENT DELEGATES FUNCTIONS OF DEFENSE PRODUCTION ACT OF 1950: Following the signing of the Defense Production Act on September 8, President Truman issued Executive Order 10161 on September 9 delegating certain functions of the Defense Act to existing government agencies. Authority to establish priorities and allocations, to requisition essential materials (including food), and to carry out other controls have been delegated by the President under this order.

Priorities, Allocations, and Requisitioning: The functions on priorities, allocations, and requisitioning are delegated as follows:

"(A) TO THE SECRETARY OF THE INTERIOR WITH RESPECT TO PETROLEUM, GAS, SOLID FUELS, AND ELECTRIC POWER.

- "(b) TO THE SECRETARY OF AGRICULTURE WITH RESPECT TO FOOD, AND WITH RESPECT TO THE DOMESTIC DISTRIBUTION OF FARM EQUIPMENT AND COMMERCIAL FERTILIZER.
- "(c) TO THAT COMMISSIONER OF THE INTERSTATE COMMERCE COMMISSION WHO IS RESPONSIBLE FOR THE SUPERVISION OF THE BUREAU OF SERVICE OF THE COMMISSION, WITH RESPECT TO DOMESTIC TRANSPORTATION, STORAGE, AND PORT FACILITIES, OR THE USE THEREOF, BUT EXCLUDING AIR TRANSPORT, COASTWISE, INTERCOASTAL, AND OVERSEAS SHIPPING.
- "(d) TO THE SECRETARY OF COMMERCE WITH RESPECT TO ALL MATERIALS AND FACILITIES EXCEPT AS PROVIDED IN PARAGRAPHS (A), (B), AND (C)....."



HARRY S. TRUMAN

Functions regarding the disposition of property after it is no longer needed for the national defense are delegated to the Administrator of General Services.

Expansion of Productive Capacity and Supply: Three programs were authorized by the Act to permit an expansion of productive capacity and supply, and this authority is delegated by the Order as follows:

- (1) THE DEPARTMENTS OF THE ARMY, NAVY, AIR FORCE, INTERIOR, AND AGRICULTURE, AND THE GENERAL SERVICES ADMINISTRATION EACH IS GIVEN AUTHORITY TO GUARANTEE LOANS MADE BY ANY PUBLIC OR PRIVATE FINANCING INSTITUTIONS FOR THE PURPOSE OF FINANCING ANY CONTRACT OR OPERATION DEEMED TO BE OF IMPORTANCE TO THE NATIONAL DEFENSE BY THE GUARANTEEING AGENCY.
- (2) THE RECONSTRUCTION FINANCE CORPORATION IS AUTHORIZED TO MAKE DIRECT LOANS TO PRIVATE BUSINESS ENTERPRISES FOR THE EXPANSION OF A CAPACITY, THE DEVELOPMENT OF TECHNOLOGICAL PROCESSES, AND THE PRODUCTION OF ESSENTIAL MATERIALS, WHENEVER THE AGENCY CONTROLLING THESE MATERIALS CERTIFIES THE NECESSITY FOR SUCH LOANS.
- (3) FOR ALL MATERIALS OTHER THAN AGRICULTURAL COMMODITIES, THE ADMINISTRATOR OF GENERAL SERVICES WAS AUTHORIZED TO PURCHASE OR MAKE COMMITMENTS TO PURCHASE METALS, MINERALS, AND OTHER RAW MATERIALS FOR GOVERNMENT USE OR FOR RESALE.

Economic Stabilization: The Executive Order also establishes a new and independent agency to be known as the Economic Stabilization Agency and all functions of the Act relating to price and wage stabilization are conferred on the Administrator of this new agency. The order states:

- "(b) THE ADMINISTRATOR SHALL SEEK TO PRESERVE AND MAINTAIN THE STABILIZATION OF THE ECONOMY. TO THIS END HE SHALL:
- "(1) PLAN AND DEVELOP BOTH SHORT AND LONG-RANGE PRICE AND WAGE STABILIZATION POLICIES AND MEASURES AND CREATE THE NECESSARY ORGANIZATION FOR THEIR ADMINISTRATION.
 - "(2) INFORM THE PUBLIC, AGRICULTURE, INDUSTRY AND LABOR CONCERNING THE NEED FOR STABILIZATION AND ENCOURAGE AND PROMOTE VOLUNTARY ACTION TO THIS END.

"(3) CONSULT AND ADVISE WITH THE GOVERNMENT OFFICIALS RESPONSIBLE FOR PROCUREMENT, PRODUCTION, MANPOWER, AND RENT CONTROL, AND FOR FISCAL, CREDIT AND MONETARY POLICIES, CONCERNING MEASURES WITHIN THEIR JURISDICTION WHICH WILL ASSIST STABILIZATION.

"(4) ESTABLISH PRICE CEILINGS AND STABILIZE WAGES AND SALARIES WHERE NECESSARY.

The Economic Stabilization Agency will have a Director of Price Stabilization, and a Wage Stabilization Board (shall make recommendations to the Administrator regarding the planning and development of wage stabilization policies).

Labor Supply: The Secretary of Labor is authorized to utilize the functions vested in him so as to meet most effectively the labor needs of defense, industry, and essential civilian employment.

Voluntary Agreements: Agencies authorized to establish priorities and allocations as well as other agencies mentioned in the Order are authorized to enter into voluntary agreements with labor, industry, and agriculture with respect to the materials and facilities under their jurisdiction and as a means of controlling prices. These agencies also are assigned the power to requisition equipment, supplies, materials, or facilities necessary to the national defense (including food) with respect to the particular materials and facilities under their jurisdiction.

NOTE: ALSO SEE DEPARTMENT OF INTERIOR AND AGRICULTURE, P. 82 OF THIS ISSUE; AND NATIONAL PRODUCTION AUTHORITY, P. 83 OF THIS ISSUE. COPIES OF EXECUTIVE ORDER 10161 ARE AVAILABLE FROM THE NATIONAL PRODUCTION AUTHORITY, DEPARTMENT OF COMMERCE, WASHINGTON, D. C., OR FROM DEPARTMENT OF COMMERCE FIELD OFFICES.

BUSINESSMEN DIRECTED TO PRESERVE PRICE, WAGE, AND PRODUCTION RECORDS: On September 9 President Truman issued Executive Order 10160 directing certain businessmen to preserve records for the period May 24 to June 24, 1950, as they relate to prices, wages, and other costs or production. The full text of the Order follows:

EXECUTIVE ORDER 10160

PROVIDING FOR THE PRESERVATION OF RECORDS FOR CERTAIN PURPOSES OF THE DEFENSE PRODUCTION ACT OF 1950

By virtue of the authority vested in me by the Defense Production Act of 1950, and as President of the United States, and in order to provide an appropriate basis for action under Title IV of the Defense Production Act of 1950, it is hereby ordered:

1. Every person who sold or delivered goods or services, or offered them for sale or delivery, in the course of trade or business during the period from May 24, 1950, to June 24, 1950, inclusive, shall preserve all his records for such period relating to:

- (a) The prices received or asked for such goods or services; and
- (b) The labor, material, acquisition, and other costs incurred in connection with such goods or services.

2. This order does not apply to:

- (a) Records of an individual relating to wages or salary received by such individual;

- (b) Records relating to sales of agricultural commodities by the individual producer thereof; and

- (c) Records relating to the following, which are exempt from control under section 402 (e) of the Defense Production Act of 1950: (i) prices or rentals for real property; (ii) rates or fees charged for professional services; (iii) prices or rentals for (a) materials furnished for publication by any press association or feature service, or (b) books, magazines, motion pictures, periodicals, or newspapers, other than as waste or scrap; or rates charged by any person in the business of operating or publishing a newspaper, periodical, or magazine, or operating a radio-broadcasting or television station, a motion-picture or other theater enterprise, or outdoor advertising facilities; (iv) rates charged by any person in the business of selling or underwriting insurance; (v) rates charged by any common carrier or other public utility; and (vi) margin requirements on any commodity exchange.

3. For the purposes of this order:

- (a) The term "person" includes an individual, corporation, partnership, association, or any other organized group of persons, or legal successor or representative of the foregoing, and includes the United States or any agency thereof, or any other government, or any of its political subdivisions, or any agency of any of the foregoing.

- (b) The term "prices" includes rentals, commissions, margins, rates, fees, charges, and allowances paid or received.

- (c) The term "goods" has the same meaning as the term "materials" in the Defense Production Act of 1950 and includes raw materials, articles, commodities, products, supplies, components, technical information, and processes.

HARRY S. TRUMAN

THE WHITE HOUSE,
September 9, 1950; 10:45 a. m.

[F. R. Doc. 50-8017; Filed, Sept. 9, 1950; 10:45 a. m.]



Department of Agriculture and Department of the Interior

AGRICULTURE DELEGATES DEFENSE FISHERY AUTHORITY TO INTERIOR: Certain authority under the Defense Production Act relating to the production of fishery commodities and products was delegated by the Secretary of Agriculture to the Secretary of the Interior on October 13. The text of the order issued by the Secretary of Agriculture follows:

DELEGATION OF AUTHORITY BY THE SECRETARY OF AGRICULTURE TO THE SECRETARY OF THE INTERIOR WITH RESPECT TO FISHERY COMMODITIES

THE DEPARTMENT OF THE INTERIOR HAS CERTAIN RESPONSIBILITIES AND EXERCISES CERTAIN FUNCTIONS WITH RESPECT TO THE PRODUCTION OF THE NATION'S SUPPLY OF FISHERY COMMODITIES. IT IS HIGHLY DESIRABLE IN ORDER TO INSURE THE NECESSARY PRODUCTION, THAT THE EXERCISE OF ALL FUNCTIONS WITH RESPECT TO THE PRODUCTION OF FISH BE CLOSELY COORDINATED. TO EFFECTUATE THIS PURPOSE AND TO UTILIZE TO THE FULLEST EXTENT POSSIBLE THE TECHNICAL KNOWLEDGE AND EXPERIENCE OF THE FISHERY STAFF OF THE DEPARTMENT OF THE INTERIOR, IT IS THE PURPOSE OF THE SECRETARY OF AGRICULTURE TO DELEGATE TO THE SECRETARY OF THE INTERIOR CERTAIN FUNCTIONS DELEGATED TO THE SECRETARY OF AGRICULTURE UNDER EXECUTIVE ORDER NO. 10161 DATED SEPTEMBER 9, 1950.

THEREFORE, PURSUANT TO THE PROVISIONS OF SECTION 902(B) OF EXECUTIVE ORDER NO. 10161, THE SECRETARY OF AGRICULTURE HEREBY DELEGATES, SUBJECT TO THE TERMS AND CONDITIONS SET FORTH HEREIN, TO THE SECRETARY OF THE INTERIOR THE FOLLOWING FUNCTIONS:

- (1) THE PRIORITY AND ALLOCATION FUNCTIONS DELEGATED TO THE SECRETARY OF AGRICULTURE UNDER SECTIONS 101(B) AND 102 OF THE EXECUTIVE ORDER WITH RESPECT TO THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS.
- (2) THE CLAIMANT FUNCTIONS UNDER SECTION 103(A) WITH RESPECT TO ALL MATERIALS AND ADDITIONAL FACILITIES REQUISITE TO THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS, BUT EXCLUDING TIN CONTAINER SUPPLY AND MATERIALS AND FACILITIES USED IN COMMON FOR PROCESSING OF FISH AND OTHER FOODS; PROVIDED: THAT THE SECRETARY OF THE INTERIOR, PRIOR TO THE EXERCISE OF THIS CLAIMANT FUNCTION SHALL, TO ASSURE FULL COORDINATION, NOTIFY THE SECRETARY OF AGRICULTURE OF HIS INTENT TO DO SO, AND SHALL PROVIDE WITH EACH NOTICE COMPLETE AND DETAILED INFORMATION AS TO THE MATERIALS AND ADDITIONAL FACILITIES CONCERNED.
- (3) SUCH REQUISITIONING FUNCTIONS AS ARE DELEGATED TO THE SECRETARY OF AGRICULTURE UNDER SECTION 201(A) OF THE EXECUTIVE ORDER WITH RESPECT TO THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS, EXCEPT THAT WITH RESPECT TO THE PROCESSING OF FISH THE SECRETARY OF AGRICULTURE RESERVES THE RIGHT TO PROHIBIT OR MODIFY THE EXERCISE OF THIS FUNCTION IN ANY INSTANCE WHERE, IN HIS OPINION, SUCH ACTION WOULD INTERFERE WITH OR HAVE AN ADVERSE EFFECT UPON THE PROCESSING OF OTHER FOODS; PROVIDED: THAT THE SECRETARY OF THE INTERIOR, PRIOR TO THE EXERCISE OF THE REQUISITIONING FUNCTION, SHALL NOTIFY THE SECRETARY OF AGRICULTURE OF HIS INTENT TO DO SO. THE SECRETARY OF AGRICULTURE WILL CONSULT WITH THE SECRETARY OF THE INTERIOR IN ORDER TO ASSURE FULL COORDINATION BEFORE EXERCISING THE REQUISITIONING FUNCTION WITH RESPECT TO FOOD PROCESSING WHEN HE DETERMINES THAT SUCH ACTION MAY INTERFERE WITH THE PROCESSING OF FISH.
- (4) THE FUNCTION OF CERTIFYING UNDER SECTION 303 OF THE EXECUTIVE ORDER WITH RESPECT TO LOANS REQUIRED FOR THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS.
- (5) SUCH FUNCTIONS RELATING TO LABOR SUPPLY AS ARE DELEGATED TO THE SECRETARY OF AGRICULTURE UNDER SECTION 601(B) OF THE EXECUTIVE ORDER WITH RESPECT TO THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS.
- (6) THE FUNCTION DELEGATED TO THE SECRETARY OF AGRICULTURE UNDER SECTION 701(A)(1) OF THE EXECUTIVE ORDER WITH RESPECT TO THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS.
- (7) THE FUNCTIONS DELEGATED TO THE SECRETARY OF AGRICULTURE UNDER SECTIONS 902(A), (B), (D)(1), (D)(2), AND 904 OF THE EXECUTIVE ORDER WITH RESPECT TO THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS.

- (8) THE TERM "PRODUCTION" AS USED HEREIN MEANS THE CATCHING AND HARVESTING OF ANY FORM OF AQUATIC ANIMAL OR PLANT LIFE AND THE PROCESSING THEREOF.
- (9) THE TERM "FISHERY COMMODITIES OR PRODUCTS" AS USED HEREIN MEANS ANY EDIBLE OR NONEDIBLE FISH, ANY FORM OF AQUATIC ANIMAL OR PLANT LIFE, OR ANY OTHER COMMODITY OR PRODUCT, INCLUDING FATS AND OILS, OF MARINE OR FRESH WATER ORIGIN, WHICH IS WITHIN THE MEANING OF THE TERM "FOOD" AS DEFINED IN SECTION 901(B) OF THE EXECUTIVE ORDER.

THE FUNCTIONS HEREBY DELEGATED TO THE SECRETARY OF THE INTERIOR SHALL BE EXERCISED WITH RESPECT TO THE PRODUCTION OF FISHERY COMMODITIES OR PRODUCTS TO FULFILL THE REQUIREMENTS FOR MILITARY, ESSENTIAL CIVILIAN, AND FOREIGN NEEDS, AS DETERMINED BY THE SECRETARY OF AGRICULTURE.

NOTHING HEREIN SHALL BE CONSTRUED TO DELEGATE TO THE SECRETARY OF THE INTERIOR FUNCTIONS VESTED IN THE SECRETARY OF AGRICULTURE WITH RESPECT TO (1) THE DISTRIBUTION IN CONSUMER CHANNELS OF UNPROCESSED FISHERY COMMODITIES AFTER DELIVERY TO THE INITIAL PURCHASER; OR (2) THE DISTRIBUTION; PROCUREMENT; INSPECTION; CONTAINER SUPPLY; SPECIFICATION OF PRODUCT, CONTAINER, STANDARDS, AND LABELING; OF OR RELATING TO, PROCESSED FISHERY COMMODITIES OR PRODUCTS.

ISSUED AT WASHINGTON, D. C., THIS 13TH DAY OF OCTOBER, 1950.

/s/ CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE



Department of Commerce

NATIONAL PRODUCTION AUTHORITY

INVENTORY CONTROL: In order to prevent the accumulation of excessive inventories of materials in short supply, the National Production Authority of the U. S. Department of Commerce, under the authority of the Defense Production Act of 1950, issued Regulation 1 on inventory control. This regulation, which became effective on September 18, 1950, applies to all trades and industries. It limits the quantities that can be ordered, received, or delivered of certain specific materials listed, and in the shapes and forms specified.

The general categories of materials included are building materials, chemicals, forest products, iron and steel, metals and minerals, rubber materials, and textile materials. Among the materials listed, only a few are of interest to the fishing and allied industries. Under metals and minerals are included tin (primary and secondary), and all tin and tin base alloy scrap containing commercially recoverable tin. Under textile materials are included, burlap (Hessian), and nylon staple and nylon filament yarn.

* * * * *

BASIC RULES OF THE PRIORITIES SYSTEM: The basic rules of the priorities system to be administered by the National Production Authority in the Department of Commerce are contained in Regulation 2, effective October 3, 1950, issued by that agency. This directive states what kind of orders are rated orders, how to place them, and the preference status of such orders. These rules apply to all business transactions within the jurisdiction of NPA but do not include the allocation and distribution of certain specific items (among which are included food, gas, electric power, etc.) which are under the jurisdiction of other agencies.

¹/UNDER THE JURISDICTION OF THE DEPARTMENT OF AGRICULTURE. SEE P. 82 OF THIS ISSUE ON DELEGATION OF FISH PRODUCTION AUTHORITY TO INTERIOR BY AGRICULTURE.

NOTE: COPIES OF REGULATION 1 (SEPT. 18, 1950) AND REGULATION 2 (OCTOBER 3, 1950) ARE AVAILABLE FROM THE NATIONAL PRODUCTION AUTHORITY, DEPARTMENT OF COMMERCE, WASHINGTON 25, D. C., OR FROM DEPARTMENT OF COMMERCE FIELD OFFICES.

Department of the Interior

INTERIOR TRADE AGREEMENT REPRESENTATIVE DESIGNATED: The Secretary of the Interior on October 24 designated William E. S. Flory as the Department's representative, until further notice, on the Interdepartmental Trade Agreements Committee and the Committee on Reciprocity Information. An executive Order signed by President Truman on October 12 provided for membership of the Department on the two committees.^{1/}

The Trade Agreements Committee advises the President with respect to negotiations and provisions of trade agreements while the Committee for Reciprocity Information conducts public hearings and receives views and information from interested persons concerning proposed negotiations under the trade agreement programs.

Experts in the Fish and Wildlife Service, the Bureau of Mines and the Office of Territories will participate in the work of the two committees with Flory coordinating their efforts within the Department. He will join the United States delegation in Torquay, England, later to participate in the tariff and trade negotiations which are now in progress.

The Fish and Wildlife Service will participate on problems concerning American and foreign fishing industries, trade in fishery products, and trade problems in wildlife and furs.

Flory has served in the Department for the past year working on international programs.

^{1/}ALSO SEE P. 79 OF THIS ISSUE.



Eighty-first Congress (Second Session)

The following was not reported in this section in the October 1950 issue of the Commercial Fisheries Review:

SIGNED BY THE PRESIDENT:

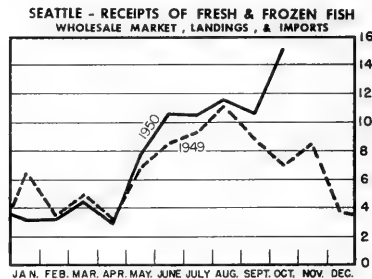
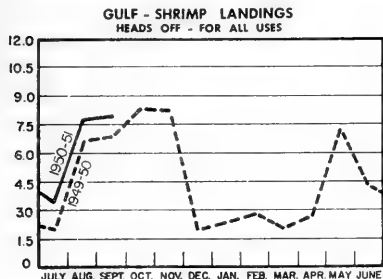
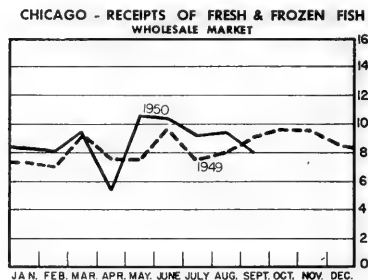
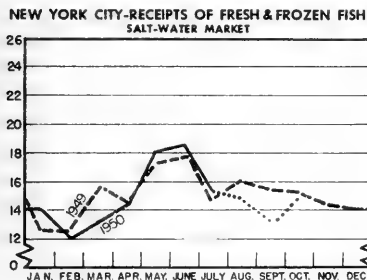
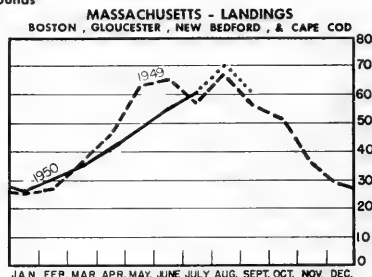
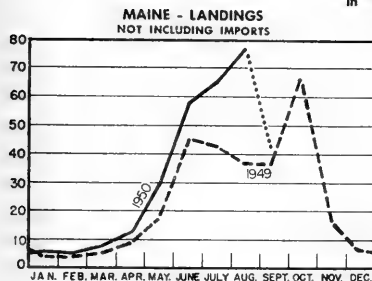
Public Law 845 (S. 2801) - An act to give effect to the International Convention for the Northwest Atlantic Fisheries, signed at Washington under date of February 8, 1949, and for other purposes. Signed September 27, 1950.

NOTE: BOTH THE SENATE AND THE HOUSE ADJOURNED ON SEPTEMBER 23, 1950, UNTIL NOVEMBER 27, 1950.

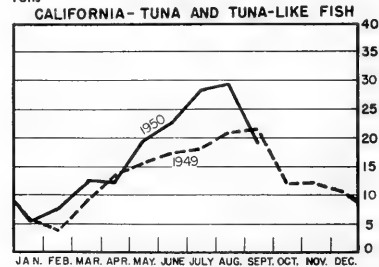
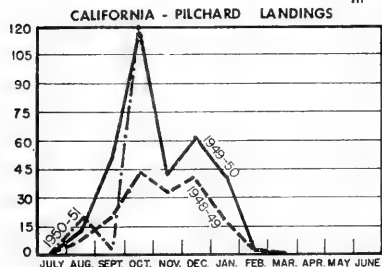


LANDINGS AND RECEIPTS

In Millions of Pounds



In Thousands of Tons

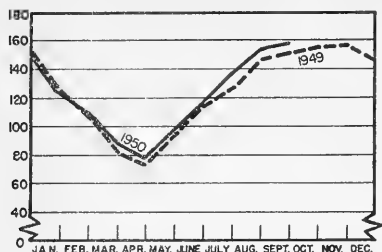


..... ESTIMATED

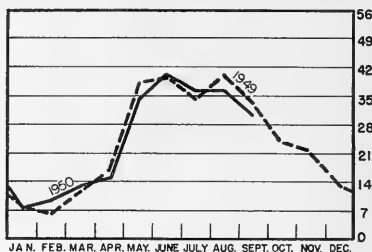
COLD STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS

In Millions of Pounds

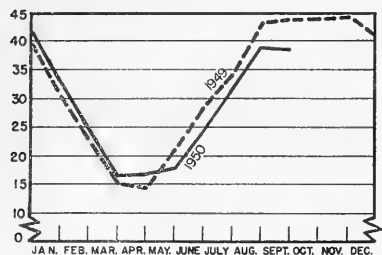
U.S. & ALASKA - HOLDINGS OF FROZEN FISH



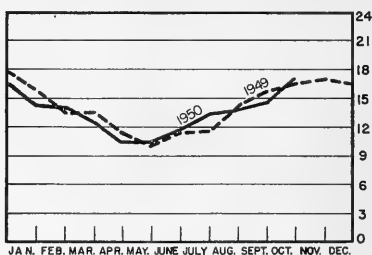
U.S. & ALASKA - FREEZINGS



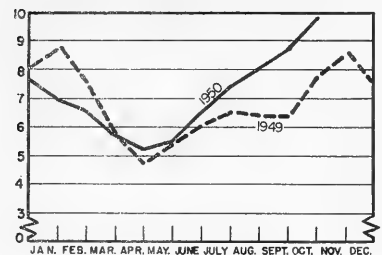
NEW ENGLAND - HOLDINGS OF FROZEN FISH



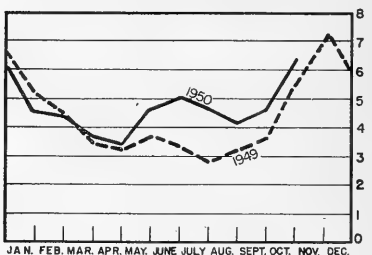
NEW YORK CITY - HOLDINGS OF FROZEN FISH



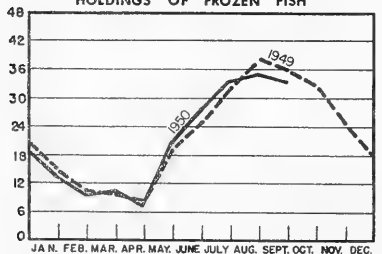
CHICAGO - HOLDINGS OF FROZEN FISH



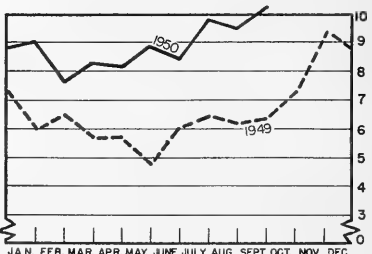
GULF - HOLDINGS OF FROZEN FISH



WASHINGTON, OREGON, AND ALASKA - HOLDINGS OF FROZEN FISH

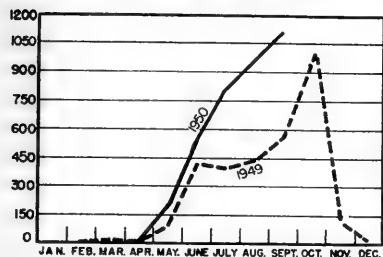


CALIFORNIA - HOLDINGS OF FROZEN FISH

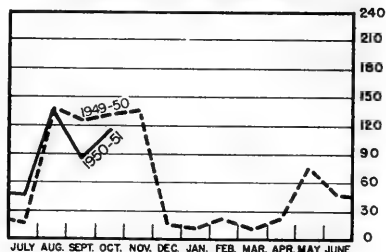


CANNED FISHERY PRODUCTS

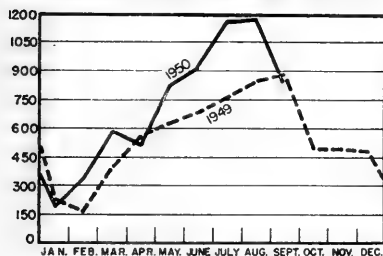
MAINE - SARDINES, ESTIMATED PACK



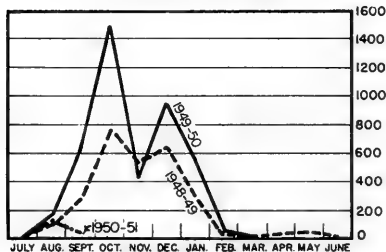
UNITED STATES - SHRIMP



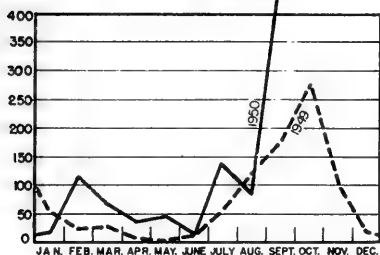
CALIFORNIA - TUNA AND TUNA-LIKE FISH



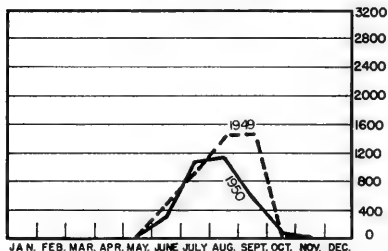
CALIFORNIA - PILCHARDS



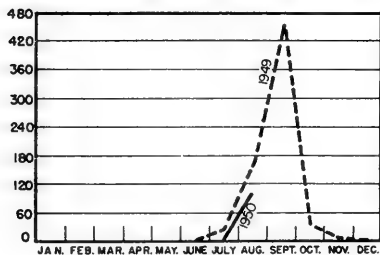
CALIFORNIA - MACKEREL



ALASKA - SALMON



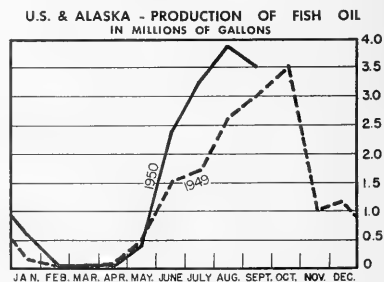
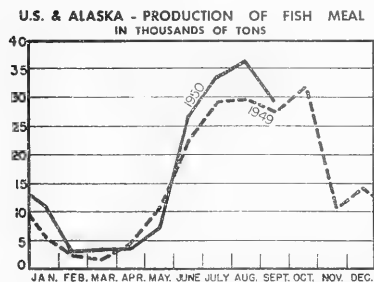
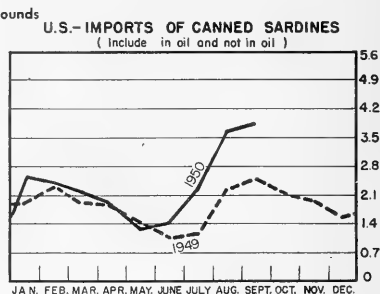
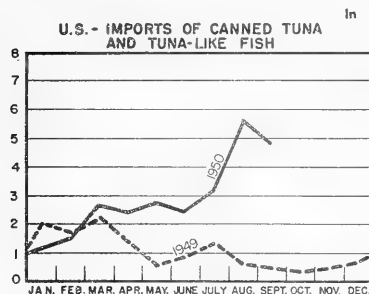
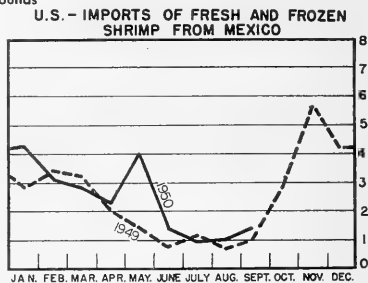
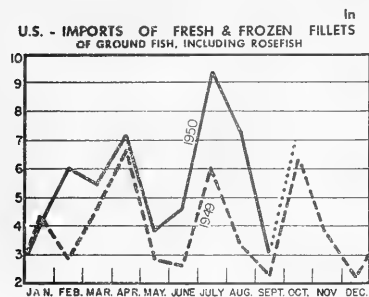
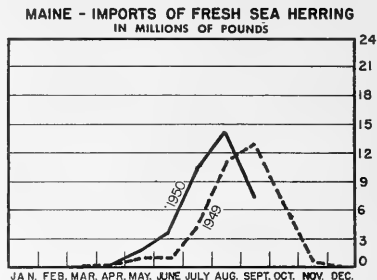
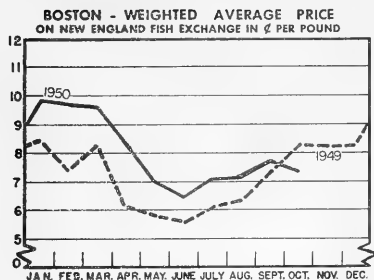
WASHINGTON - PUGET SOUND SALMON



STANDARD CASES

Variety	No. Cans	Can Designation	Net. Wgt.
SARDINES	100	1/4 drawn	3 1/4 oz.
SHRIMP	48	—	5 oz.
TUNA	48	No. 1/2 tuna	7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
MACKEREL	48	No. 300	15 oz.
SALMON	48	1-pound toll	16 oz.

PRICES, IMPORTS and BY-PRODUCTS





RECENT FISHERY PUBLICATIONS

Recent publications of interest to the commercial fishing industry are listed below.

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
- FL - FISHERY LEAFLETS.
- MDL - MARKET DEVELOPMENT SECTION LISTS OF DEALERS, LOCKER PLANTS, ASSOCIATIONS, ETC.
- SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- SSR - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
- SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-572	- Frozen Fish Report, September 1950, 10 p.
CFS-575	- Fish Meal and Oil, August 1950, 2 p.
CFS-576	- Massachusetts Landings, May 1950, 14 p.
CFS-577	- Canned Fish and Byproducts, 1949 Annual Summary, 20 p.
CFS-579	- Packaged Fish, 1949 Annual Summary, 4 p.
CFS-582	- Texas Landings, September 1950, 4 p.
CFS-583	- Maine Landings, August 1950, 4 p.
CFS-585	- Massachusetts Landings, June 1950, 14 p.
FL -336f	- Quarterly Outlook for Marketing Fishery Products, October-December 1950, 35 p.
FL -382	- Mesh Size and Construction as a Factor in Releasing Small Fish and Shrimp from Trawl Nets, 11 p.

Number	Title
SL -109 (Revised)	- Firms Canning Caviar and Fish Roe, 1949, 2 p.
MDL-51 (Revised)	- Officials of Refrigerated Locker Plant Associations, State and National, 4 p.
SSR-Fish 53	- Seasonal Variations in Toxicity of Butter Clams from Selected Alaska Beaches, by John S. Chambers and Harris W. Magnusson, processed, August 1950, 19 p.
Sep. 259	- Some Processing and Technological Methods in the Japanese Fisheries.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE AGENCIES OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

Age, Rate of Growth, and General Life-History of the Australian Pilchard (SARDINOPS NEOPILCHARDUS) in New South Wales Waters, by M. Blackburn, Bulletin No. 242, 86p. and illus. with 8 plates. Commonwealth Scientific and Industrial Research Organization, East Melbourne, Australia, 1949. An analysis of the age and rate of growth of the pilchard from the time of its hatching at sea, through the inshore phase which occurs early in the first year of its life, and to its eventual return to the sea and attainment of maturity

between the age of two to three years. These studies on the age and growth rate of the unexploited pilchard of New South Wales were carried out by means of scale-readings and analysis of length-frequency distributions. In growth-rate and in general life history, the author states, the New South Wales pilchard resembles that of the Atlantic coasts of south-western Europe more than it does the other closely related pilchard groups that have been studied elsewhere.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM.

Annual Report (New Jersey Division of Fish and Game),

For the Fiscal Year Commencing July, 1948, and Ending June 30, 1949, 47 p., printed, Division of Fish and Game, New Jersey Department of Conservation and Economic Development, Trenton, N. J. Among other things, this publication gives a very brief summary of New Jersey's pound fisheries; number of menhaden and food fish licenses, and special netting licenses issued by the State; and a statistical summary of the Delaware River and Hudson River shad industries (number of men, boats, fish and pounds of shad caught, value of catch, and value of boats and gear).

Annual Report of the Federal Security Agency, 1949,

670 p., printed, \$1.50 Federal Security Agency, Washington, D. C. (For sale by Superintendent of Documents, Washington, D. C. Separate reprints of the reports of each of the Agency's constituent organizations are also for sale.) Contains the 1949-50 fiscal year report of all the agencies in the Federal Security Agency, including the Public Health Service and the Food and Drug Administration. Activities of the latter two agencies are of interest to the fishing and allied industries since some of their functions are connected with fisheries. The report of the Public Health Service includes information on shellfish sanitation and water pollution. The report of the Food and Drug Administration discusses the actions taken by the Agency on foods (including sea food) and includes information on the seafood inspection service, court interpretations (one on canned oysters), and scientific investigations conducted by the agency (including crab meat, oysters, frozen shrimp, and vitamin B₁₂).

Annual Report for 1949, 181 p., illus., printed.

Department of Fisheries, State of Washington, Seattle, Wash., 1950. Reports on the activities of the Washington's Department of Fisheries. This report is divided into four parts: (1) The Salmon Fishery, (2) Shellfish and Bottom Fish, (3) Law Enforcement, and (4) Commercial Fishing Statistics. The section on commercial fishing statistics gives 1949 data for the entire State, together with comparative data; detailed statistics for Puget Sound, Grays Harbor, Willapa Harbor, and Columbia River; and data on number of licenses, financial receipts, and appropriations. The salmon fishery section discusses stream improvement, biological research, hatcheries, hatchery construction, and cooperative programs. Bottom fishing, other trawling, razor clams, and oyster studies are reported upon in the section on shellfish and bottom fish. An appendix is included and it contains information on smoke curing of salmon; life history and habits of the Pacific razor clam; notes on the biology of oysters; life history and habits of the commercial crab; Washington's fishery resources; hatchery procedures; and a list of Washington's food fisheries.

Australian Journal of Marine and Freshwater Research,

April 1950, vol. 1, no. 1, 154 p., plus plates, illus., printed, 76d per issue (approx. 85 cents). Commonwealth Scientific and Industrial Research Organization, 314 Albert Street, East Melbourne, C2, Victoria. Published as a medium for the publication of the results of original investigations

on sea, estuarine, and freshwater fisheries and related subjects. Will be issued as material becomes available. The following articles appear in this first issue: "A Biological Study of the Anchovy, *Engraulis australis* (White), in Australian Waters;" "Investigations on Underwater Foulings;" "The Role of Bacteria in the Early Stages of Fouling;" "The Biology of Fouling in Australia: Results of a Year's Research;" "Note on the Fouling Organisms Attached to Naval Mines in North Queensland Waters;" "The Condition of the Fishery for Barracouta, *Thyrsites atun* (Euphrasen), in Australian Waters;" "The Bacteriology of Shark Spoilage;" and "The Effects of the Orientation of Cultch Material on the Setting of the Sydney Rock Oyster."

Bibliography of Canadian Biological Publications for 1947, by J. Murray Speirs and J. M. Johnston, 102 p., printed, Ontario Fisheries Research Laboratory, Department of Zoology, University of Toronto and Research Council of Ontario's Advisory Committee on Fisheries and Wildlife, Toronto, Ont., February 1950. Lists the biological literature written by Canadians, or dealing with Canadian wildlife and fisheries. Among the subjects included are fishing, shellfish, fish, fisheries, fish products and by-products, fishery management, ecology, and processing (includes processing of fishery products). This bibliography is arranged alphabetically by subject, and within the subject by author, publication, date, and page. An author index is included, and a list of the publications which were not listed in the 1946 bibliography is appended.

Canadian Fishery Markets, Market Bulletin No. 4, in two volumes--Vol. 1: "Outlook for 1950," 32 p.; and Vol. 2: "Review of 1949," 36 p.; processed. Department of Fisheries, Ottawa, Canada, May 1950. Volume 1 gives the outlook for the marketing of fishery products during 1950. It deals with production and the food supply; the general outlook for Canadian, United States, and foreign markets; and the outlook according to types of products, including fresh, frozen, canned, etc. Volume 2 reviews the 1949 production and trade in fishery products in Canada, the United States, and foreign countries.

A Comparison of the Bluefin Tunas, Genus *Thunnus*, from New England, Australia, and California, by H. C. Gotsdill and Edwin K. Holmberg, Fish Bulletin No. 77, 55 p., illus. Bureau of Marine Fisheries, Division of Fish and Game, San Francisco, Calif., 1950. The study presented in this publication was undertaken to clarify the systematic relationship of the various tunas. The purpose of the study was to determine whether positive, diagnostic differences exist between the Atlantic bluefin and California bluefin, on the one hand, and between the Australian southern bluefin and the California bluefin, on the other hand. The authors conclude that the Australian southern bluefin *T. maccoyii* is entirely distinct from the remaining members of the genus and can be identified positively by a number of characters. The bluefin of the California coast is remarkably similar to that of the Atlantic coast, but it can be distinguished by at least four internal characters and possibly the gill-raker count. Specimens of the *T. thynnus* from the eastern and western Atlantic appear to be identical in most characters. There is a striking similarity between *T. thynnus* of the California coast and *T. orientalis* of Japan, but until certain differ-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM.

ences are further investigated, *T. orientalis* must be considered as a species distinct from *T. thynnus* of the Pacific American coast.

A Directory of Marine Laboratories of the United States and Canada, by Robert W. Hiatt, Contribution No. 4, 70 p., processed. Hawaii Marine Laboratory, Honolulu, T. H. The laboratories are listed in alphabetical order, and an index to them is included. Persons affiliated with each laboratory in 1949 are listed. Information listed for each marine scientist includes his address at a marine laboratory and his permanent address, his special field of training, and his current research project, if available.

Foreign Government Purchasing Agencies, 5 p., processed. Business Information Service, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington 25, D. C., August 1950. This list consists principally of foreign government purchasing missions operating in the United States. Only those missions of foreign governments which have procurement and purchasing functions are listed. The list also includes the names of the French groups and certain foreign government purchasing agencies located abroad.

"Great Lakes Fisheries," by Spencer M. Bower, article, *Michigan Conservation*, September-October 1950, vol. XIX, no. 5, pp. 7-10, 25-26, illus., printed, 50 cent per year. Michigan Department of Conservation, Lansing, Mich. A discussion of Michigan's commercial Great Lakes fisheries, including production, types of gear used, and regulations affecting commercial fishing.

Guide for the Prospective American Importer, 44 p., printed, free. Economic Cooperation Administration, Washington, D. C., September 1950. This is a handbook on the principles of importing. Important "do's" and "don'ts" for actual and potential importers of goods from Marshall Plan countries are highlighted in this publication, which was prepared in collaboration with non-governmental organizations interested in foreign trade and with the U. S. Department of Commerce. Designed to assist businessmen in gathering adequate information on foreign trade, making correct policy decisions on matters involving importing, and formulating sound plans for engaging in importing enterprises, this booklet delineates seven steps which must be taken by any firm contemplating entering the import field, either as an importer of raw materials, consumer specialties, or consumer staples. Discusses importing for the manufacturer, wholesaler or jobber, and retailer. An appendix gives further helpful hints, listing such items as commercial abbreviations, definitions of shipping terms, foreign trade terminology, and the like.

Handbook of Freshwater Fishery Biology, Kenneth D. Carlander, 290 p., printed, \$4.50. Wm. C. Brown Company, Dubuque, Iowa, 1950. This handbook is primarily a quick-reference source book to data on fresh-water fish. Consists mostly of tabular material for which conservationists and biologists have frequent need, and it will aid research workers as a bibliographical guide to original investigations. To keep the tabular compilations up to date, periodic supplements are planned by the Iowa Cooperative Fisheries Research Unit, Iowa State College, Ames, Iowa, of which the author is a member. In order to draw attention to

the variability of data from various areas, the information presented is tabulated rather than completely summarized. The book consists of instructions for reading the tables; an explanation of the methods used for arriving at lengths, ages, calculated lengths, length-weight relationship, condition index, and fecundity data; suggestions for conducting a simple age and growth study; life histories by species; population data; conversion tables; literature cited; and alignment charts and monographs. In addition to the life history information, creel census and other fish population data are tabulated for ready reference. As a measure of "success of fishing," figures on catch per man-hour, per trip, or per day are given for several species, for several types of water, and for various types of tackle. Data on the annual yield per acre to commercial and sport fisheries are also given. Total populations, as determined by draining, poisoning, electric shocker, or marking and recovery techniques, are summarized on a poundage or number-per-acre basis. Over 1,100 references are included in the literature cited section of this book.

Maine Lobster Recipes, 24 p., illus., printed. Department of Sea and Shore Fisheries in cooperation with the Maine Development Commission, Augusta, Maine. The State of Maine Department of Sea and Shore Fisheries and a national brewing company through its magazine *The Journal of the Societe Des Cantilshommes Chefs de Cuisine*, recently conducted a nationwide Maine Lobster Recipe Contest. This booklet presents 27 recipes chosen from those submitted by famous chefs, maitres d'hotel, connoisseurs of fine foods, and gourmets. Included are such recipes as Baked Maine Lobster De Luxe, Maine Lobster Espenol, Lobster Oriental, Lobster Thermidor, Lobster Polynesian, and Lobster Curry.

Measures of Abundance of Certain Pelagic Fish in Some South-Eastern Australian Waters, by M. Blackburn and J. A. Rubb, Bulletin No. 251, 74 p., and illus. with 2 plates. Commonwealth Scientific and Industrial Research Organization. Eastern Melbourne, Australia, 1950. Analyzes data on the geographical distribution and seasonal fluctuations of surface-swimming fish in south-eastern Australian waters collected by the CSIRO Division of Fisheries and its collaborators over the past years. The pelagic fish covered in the report are tunas, horse mackerel, pilchards, anchovies, Australian "salmon," and others. Progress which has been made in developing these fisheries and the lines along which success may most probably be achieved in the future are discussed. General levels of abundance, at the principal seasons of the year, of the most important non-scombroid pelagic fish in certain waters of south-eastern Australia are indicated. This report is intended for the information and general encouragement of those who may be interested in exploiting these species, few of which are adequately used at present in Australia.

Our Foreign Policy, Department of State Publication 3972, General Foreign Policy Series 26, 100 p., printed, 25 cents. Office of Public Affairs, U. S. Department of State, Washington 25, D. C. (For sale by the Superintendent of Documents, Washington, D. C.). A brief survey of American aims and policies

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with regard to our relations with other governments and their peoples issued at the suggestion of President Truman. Indicates what the foreign policy of our Government is at present.

Prospects for the 1950-51 Herring Fishing Season, by J. C. Stevenson, Circular No. 21, August 1950, 4 p., processed. Pacific Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C. Contains a prediction of the prospects of the 1950-51 herring fishing season off British Columbia by districts.

Report for Fiscal Year October 1, 1948-September 30, 1949 (Alabama), 159 p., illus., printed. Alabama Department of Conservation, Montgomery, Ala., 1949. Included in this publication is a discussion of the Seafoods Division, fisheries research, and a report by the Division of Game, Fish and Seafoods. Some data on shrimp and oyster production are given.

Summaries of Tariff Information (Separate summaries for Specific Fishery Products). U. S. Tariff Commission, Washington 25, D. C. Limited supply of these separate summaries are available. The Commission has compiled summaries on specific fishery products which are duty free. A limited supply of separate pages from these summaries for the following specific fishery products are available:

Commodity	Tariff Par. No.	Pages
Cod Oil and Cod-Liver Oil	1730	3-6
Eulachon Oil	1730	7
Products of American Fisheries	1730	9-20
Fish Meal, Scrap, and Cake	1780 and 1685	55-70
Cuttlefish Bone	1666	69-70
Turtles	1790	111-4
Fish Soundings	1624	165, 186
Eggs of Birds, Fish and Insects	1671	179-80
Sea Herring, Fresh or Frozen	1756	183-202
Aquarium Fish, Including Goldfish	1677	203-7
Abalone	1761	215-6
Clams (Except Canned Clams and Canned Clam Products)	1761	217-21
Crabs	1761	222-5
Loose Lobsters	1761	226-37
Oysters (Except Canned Oysters and Canned Oyster Products)	1761	238-44
Scallops	1761	245-7
Shrimp	1761	248-52
Shellfish, N.S.P.F.	1761	253-8
Shellfish Pastes and Sauces (Except Crab, Clam, and Oyster)	1761	259-61

The above summaries include statistics on production, domestic exports, and imports for consumption for certain years from 1931 to 1948. In addition, there are comments on each product—uses, prices, and consumption in the United States, tariff status, and other pertinent data.

"Summer Fishing on Lake Winnipeg," article, Trade News, August 1950, vol. 3, no. 2, pp. 21-3, illus., processed. Department of Fisheries, Ottawa, Canada. Discusses the summer fishing on Lake Winnipeg—production, type of gear and boats used, and marketing of the fish.

Survey of Food and Nutrition Research in the United States, 1948-49 (A Compilation of Research Pertaining to Foods and Nutrition in Academic, Government, and Industrial Laboratories), by the Committee on Survey of Food and Nutrition Research of the Food and Nutrition Board, National Research Council, 311 p., printed, \$1.75. Reproduced and Distributed by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 1950. This is the second classified listing of projects dealing with food and nutrition research, and including the responsible organizations and the professional personnel. The contents include those research projects reported in the first edition which continued active and new projects activated between March 1948 and March 1950. A large number of research projects dealing with fishery products and byproducts are included. Projects which have more recently been terminated and sources of financial support which have been discontinued are indicated. The number of projects listed has increased from approximately 4,000 to 4,500. The main subjects included are physiology, chemistry, technology, microbiology, and in addition, food acceptance and nutrition education studies. Fishery products are specifically included under chemistry (food composition and nutritive value) and technology (developmental research on food products). Under technology are included processing methods (canning, dehydrating, freezing, and packaging); under microbiology are included research projects dealing with food spoilage and prevention, and bactericides for food processing plants. Lists of organizations and personnel engaged in the various projects listed as well as an index, are included.

Third Annual Report of the Director (1st April 1949-31st March 1950), 8 p., printed. Fishing Industry Research Institute, Cape Town, South Africa. Reviews the work of the Institute for the fiscal year April 1, 1949-March 31, 1950. A short discussion of the various investigations conducted by the Institute is included. Among the investigations mentioned are the following: tomato in fish packs, crawfish canning, weight losses and contraction of crawfish, shrinkage of pilchards during heating, processing temperature for pilchards in tomato, storage changes in canned pilchards, plain vs. lacquered cans for canned pilchards, canning of abalone, bacterial contamination of ice, preservation of fish offal aboard trawlers, pilchard pressing, protein determinations in fish meal, and crawfish freezing. In addition, the publication reports on the inspections and analyses made by the Institute.

"£2,000,000 Pilchard Harvest: Report on Cape West Coast Fishery," article, The South African Shipping News and Fishing Industry Review, August 1950, vol. 5, no. 8, pp. 57-57, illus., printed. S. A. Trade Newspapers (Pty.) Ltd., Riebeck Square, Cape Town, South Africa (approx. 25 cents per issue). A full report of South Africa's pilchard industry. Discusses its beginnings, production, number of plants, capacity

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of plants, products manufactured, reduction processes used, and a review of each individual company's operations.

Trade Lists

The Commercial Intelligence Branch, Office of International Trade, U. S. Department of Commerce, has published the following mimeographed trade list. Copies of this list

may be obtained by firms in the United States from that office or from Department of Commerce field offices at \$1.00 per list.

Canneries--Chile, 9 p. (September 1950); lists, among others, 35 firms canning fish and shellfish. Name, address, products handled, and annual production of each firm are given.



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Illustrator--Gustaf T. Sundstrom

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Photograph credits: Pages 15, 16, and 17 - SCAP. Other photographs in this issue anonymous.

COMMERCIAL FISHERIES REVIEW MAILING LIST BEING CIRCULA

Since Federal regulations require that all mailing lists be circularized periodically, a circularization letter dated November 15 was sent to all those on the Commercial Fisheries Review mailing list. (Individuals or firms who have been added to the mailing list subsequent to October 1, 1950, will not receive a circularization letter and will continue to be retained on the mailing list, unless the recipient meanwhile requests that his name be removed.)

COMMERCIAL FISHERIES REVIEW



Vol. 12, No. 10

OCTOBER 1950

FISH and WILDLIFE SERVICE

United States Department of the Interior
Washington, D.C.

The names of those firms and individuals who do not return the lower portion of the November 15 circularization letter will be deleted from the Commercial Fisheries Review mailing list. The January 1951 issue will be the last one to be mailed to those who do not reply. A prompt reply to the circularization letter will assure your not missing any issues of the Review.

The circularization notice contains several questions which are to be answered by the recipients of the Review. The editors respectfully urge you to answer these questions as the answers will aid the editorial staff to determine the type of material that should be published in the Review in order to better serve the needs and interests of our readers.

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